

ROYAL BOTANIC GARDENS, KEW.

---



---

# BULLETIN

OF

## MISCELLANEOUS INFORMATION.

---



---

No. 10]

[1923

### XXXVII.—THE BRITISH SPECIES OF CEUTHOSPORA AND CYTOSPORINA.

W. B. GROVE.

The two form-genera named above will be considered here together, because they both resemble *Cytospora*\*, especially in the fact that the spores can exude from the ostiole in a tendril. *Cytosporina* is separated from *Cytospora* mainly by the greater length and slightly different shape of its spores; it would, indeed, possibly be more logical if *Cytosporina* were considered merely as a subsection of *Cytospora*, were it not that its best-known members (and possibly all) belong to ascophorous genera different from those to which *Cytospora* belongs, viz., to *Eutypa* and *Cryptosphaeria*.

With regard to *Ceuthospora*, which is more divergent in form, there is a difference of opinion. Some deem the mark of the genus to reside in the straight, elongated-cylindrical, not sausage-shaped spores. But there seems to be one species, *Ceuthospora Laurocerasi*, occurring frequently on dry fallen leaves and twigs of *Prunus Laurocerasus*, which has spores as sausage-shaped as those typical of *Cytospora*, and yet this species agrees in other respects so closely with the type species of *Ceuthospora* (*C. phacidiioides*) that it seems impracticable to separate them generically. Greville, recognising their close affinity, figured them for the first time, in his Scottish Cryptogamic Flora, on two successive plates. I think that the best mark of *Ceuthospora* is to be found in the possession of two kinds of pycnidia, as described below: the cylindrical spores would then serve as a subsidiary mark. It is true that not quite all the British species are known, so far, to produce both kinds of pycnidia, but that is a deficiency which time may make good. Three of the species are ascribed as pycnidial stages to the discomycetous genus *Phacidium*, and possibly all of them belong there or to allied genera. If this connection of the coelomycetous form-genera with fixed groups of ascophorous species should turn out, on

\* K.B., 1923, p. 1.

further investigation, to be more widely spread and more definite (just as is the connection of *Phomopsis* with *Diaporthe*) the result would be of considerable help in practical pathological studies. It may be remarked, in passing, that in this case the genus *Gloeosporium* would have to be subdivided into several genera, a process indeed which has been already started.

#### CEUTHOSPORA.

Pycnidia or stromata of two kinds: (1) like those of *Cytospora*, but mostly unilocular only; (2) larger, flatter, more coriaceous, usually pseudolocellate within; immersed, then erumpent by a conico-truncate neck or more than one, often surmounted by a dark-brown leathery disc. Spores usually cylindrical, nearly or quite straight, hyaline, continuous, distinctly pedicellate, occasionally issuing in a tendril.

The basis on which I place this genus is the possession of two kinds of pycnidia—a smaller one resembling a *Phoma* or a unilocular *Cytospora*; and a larger one, having much the character of a sclerotium, and acting as a resting stage that can persist for several years, but sooner or later producing spores identical in form with those of the smaller pycnidia. In some of the species this occurrence of the two kinds is so obvious that it cannot be unnoticed, but in *C. phacididioides* the smaller pycnidia are apparently rather uncommon. Even in that species, however, they can be found at times, in close company with the larger ones on the same leaves and having exactly the same kind of spores and sporophores. It will be seen that some of these have long been known and described under different names, e.g., *Phoma cylindrospora* on *Vinca*, *Hedera*, *Euonymus*, etc., and in at any rate some cases *Phoma leucostigma*. Many specimens (perhaps most) that are called *Cytospora foliicola* belong to the same category. It will be seen that the species of *Ceuthospora* delight in thick and coriaceous leaves, such as those of *Hedera*, *Euonymus* and *Vinca*, the very plants on which *Cytospora foliicola*, *Macrophoma cylindrospora* and *Phoma leucostigma* are wont to be recorded.

**Ceuthospora Euonymi** Grove, in Journ. Bot. 1916, p. 190. *Cytospora foliicola* Lib. p.p.

Pycnidia or stromata immersed, amphigenous, of two kinds: (1) unilocular, about 0.25 mm. diam., densely crowded or somewhat scattered, prominent, subglobose, black, dehiscing by a conico-truncate opening which is surrounded by the laciniae of the epidermis and exposes the furfuraceous disc; disc often tinged with rufous; (2) plurilocular, maturing later, 0.5 mm. or more in diam., scattered, round, flat, discoid, black, somewhat shining, for a long time solid and sterile, at length dehiscing by 1–4 (usually one or two, rarely four) conico-truncate openings which are often occupied at first by a similar furfuraceous disc, but are at length filled with the white mass of the abundant exuded spores. Spores alike in both, cylindrical



with rounded ends or slightly pointed below, quite straight, usually perfectly hyaline and free from guttules,  $14-17 \times 2-2.5 \mu$  or sometimes smaller; sporophores straight, slender, of about the same length.

On leaves and twigs of *Euonymus japonicus*. Sussex; Middlesex; Hampshire; Cheshire; Ayrshire, etc. Sept.-Mar. Specimens of *Cytospora foliicola* var. *Euonymi* from the United States are quite different.

*Distrib.* France.

**Ceuthospora Feurichii** Bubák, in Annal. Mycol. 1906, iv. 115. *Cytospora foliicola* Lib. p.p.

Stromata amphigenous, somewhat uniformly scattered, black, covered by the whitish epidermis or buried deeply in the mesophyll, raising the epidermis and at length bursting it by a roundish pore, showing the white furfuraceous disc, conico-truncate, divided within into several roundish loculi, each about  $200 \times 150 \mu$ ; texture brown outside, paler within. Spores cylindric or cylindric-fusoid, slightly narrowed below,  $9-13 \times 1.5-2 \mu$ ; sporophores filiform, branched, as long as or longer than the spore.

On stems and dead or dying leaves of *Vinca minor*. Kent; Suffolk; Lanarkshire; Aberdeen. Feb., Mar. No doubt the pycnidial stage of the rare *Phacidium Vincae* Eckl.

The Aberdeen specimens have cylindrical spores,  $12-15 \times 2-3 \mu$ ; they show both types of conceptacles, with 1-3 furfuraceous discs, exactly similar in form to those of *Ceuthospora Euonymi*.

*Distrib.* France, Belgium, Germany, Denmark, Austria, Poland.

**Ceuthospora Hederae** Grove, sp. nov.

Pycnidia dimorpha: (1) alia parva, gregaria, epidermidem in 3-5 lacinias findentia, iis *Macrophomae cylindrosporae* simillima; (2) alia ampliora, planissima, durissima, coriacea, discoidea, atra vel cinereo-nigra,  $0.75-1$  mm. diam., in folii utraque pagina visibilia. Sporulae in omnibus pycnidiis prorsus similes, cylindricae, rectissimae, utrinque obtusae, eguttulatae (rarius minute pluriguttulatae), achroae,  $12-20 \times 2-3 \mu$ , sporophoris filiformibus rectis subaequilongis vel brevioribus suffultae.

*Hab.* in foliis petiolisque emortuis *Hederae Helicis*, rarius, Edgbaston, prope Birmingham, et Shropshire, Aug., Sept.

Pycnidia majora *C. phacidiodem* in mentem revocant, minora seorsum visa *Macrophomam* simulant. Pycnidia sclerotioidea saepius sterilia invenientur; eorum incunabula nonnunquam *Asteroma Hederae* nominantur. Speciem haud disparem, in foliis *Aucubae japonicae* nidulantem, cl. Boydius benevole misit, sed exemplaria pauciora quam ut describantur.

*Distrib.* France, Belgium, Italy.

**Ceuthospora latitans** Grove, in Journ. Bot. 1918, p. 314. *Dothidea latitans* Fr. Syst. Myc. ii. 552. *Dothiorella latitans*

Sacc. Syll. iii. 241. Allesch. vi. 531. *Phyllachora latitans* Sacc. Syll. ii. 610.

Stromata amphigenous, immersed, roundish, then convex and erumpent, splitting the epidermis into four or five laciniae, black outside, about 0.5 mm. diam.; loculi one or several, immersed in the brownish stroma and often imperfectly divided. Spores cylindrical, straight, obtuse at both ends or somewhat tapering below,  $8-10 \times 1.5-2 \mu$  ( $12-13 \times 2 \mu$ , Sacc.).

On dry dead blackening leaves and twigs of *Vaccinium Vitis-idaea*. Shropshire; Cheviots; Ayrshire, etc. The pycnidial stage of *Phacidium Vaccinii* Fr. In its somewhat botryose pycnidia it tends outwardly towards *Dothiorella*. It is not like *C. minima* Cooke & Hark., on *Vaccinium*, U.S.A.

*Distrib.* Switzerland, Sweden, Finland.

**Ceuthospora Laurocerasi** Grove, in Journ. Bot. 1916, p. 191. *Sphaeria Lauri* Sow. Eng. Flor. pl. 371, f. 4 (prob.), non *S. Hederae*  $\beta$ . *Lauri* Fr. Syst. Myc. ii. 521, ut dixit Grevillius. *Ceuthospora Lauri* Grev. Scot. Crypt. Flor. t. 254. Cooke, Handb. p. 465. Sacc. Syll. iii. 279, pro parte. Allesch. vi. 616 (error). Non *Cytospora Laurocerasi* Fekl. (saltem pro parte).

Conceptacles or stromata numerous, amphigenous, of two kinds: (1) small, 0.5-1 mm. diam., obtusely conical, tending to be unilocular; (2) larger, up to 1.5 mm. long, hard, sclerotial, plurilocular or pseudolocellate, brownish-black, surmounted by the elevated leathery disc which is pierced by the protruding ostiole or sometimes split into 2-4 short erect laciniae. Spores sausage-shaped, obtuse at both ends,  $4-6 \times 1-1.5 \mu$ ; spore-mass nearly colourless; sporophores crowded, filiform, slender, simple or somewhat branched, two to three times longer than the spore.

On dead leaves and twigs (not branches) of *Prunus Laurocerasus*. England, Wales, Scotland, Ireland. Aug.-Apr. The form on the twigs (usually dead shoots of the foregoing summer) is the so-called variety *ramulicola*; its pycnidia are always sclerotial, 1-1.5 mm. diam.

After long observations, I venture to suggest that there are on *Prunus Laurocerasus* four different fungi belonging to the genera under consideration, all having similar spores:—

1. *Ceuthospora Laurocerasi* Grove.
2. *Cytospora Laurocerasi* Fekl. p.p.
3. *Cytospora leucostoma* Sacc.
4. *Cytospora ambiens* Sacc.

Of these (1) occurs only on the leaves and small twigs; its spore-mass is almost colourless, its pycnidia leathery and of two kinds, although most are unilocular; (2) occurs on the larger branches, more rarely on the twigs and leaves; its spore-mass is almost colourless, its pycnidia are all of the smaller kind, and it belongs to *Valsa Laurocerasi* Tul.; (3) occurs on



the branches, very rarely on the leaves, it has the usual *Cytospora* pycnidia, and its spore-mass is distinctly pinkish; this belongs to *Valsa leucostoma* Fr.; (4) resembles (3) but the spore-mass is white, and the tendrils are white, though they soon turn to a pale-amber or turbid-yellow; this belongs to *Valsa ambiens* Sacc. These suggestions are only tentative, as a basis for future research; longer observation will probably reduce these species to a smaller number.

**Ceuthospora Mahoniae** Grove, in Journ. Bot. 1918, p. 314.

Stromata epiphyllous, gregarious, dimorphic: (1) small, 250  $\mu$  diam., with 1-7 chambers, truncate-conical, then erumpent and forming a small round whitish furfuraceous disc which is pierced by a central ostiole; (2) comparatively large, very hard, convex, prominent, solid, round or oblong, 0.5-1 mm. diam. or more, formed from the mesophyll of the leaf, blackish without, brown within, covered by the torn epidermis, then surrounded by it, enclosing 20-40 very minute round crowded loculi with white contents. Spores cylindrical, quite straight, obtuse above, eguttulate, 10-14  $\times$  1.5-2  $\mu$ .

On dead leaves of *Mahonia japonica*. Studley Castle, Warwickshire. June.

Resembling *C. Euonymi* in having two kinds of pycnidia or stromata: (1) with many loculi; (2) with few or even a single loculus, the former being later in development, though the spores are exactly the same in both. But the larger stromata of *C. Mahoniae* are quite different from anything which obtains in *C. Euonymi*.

**Ceuthospora phacidoides** Grev. Scot. Crypt. Flor. t. 253. Cooke, Handb. pp. 465, 753. Sacc. Syll. iii. 277. Allesch. vi. 615. Died. Pilz. Brand. ix. 322. *Phoma Ilicis* Desm. p.p.

Stromata of two kinds: (1) smaller, *Phoma*-like in appearance, but with 1-4 loculi (more or less connected) within, texture of wall like that of a *Cytospora*, splitting the epidermis into 3-4 triangular laciniae; (2) larger, 1-1.5 mm. diam., numerous, immersed, orbicular or nearly so, at first flat, pitch-black, shining, enclosing 3-7 closely combined loculi; ostiole (when perfect) in the centre of a white furfuraceous disc, surrounded by the epidermis which becomes raised in the centre to form a whitish spot, and ultimately splits into 3-5 laciniae. Spores all alike, cylindrical, usually quite straight, obtusely rounded at both ends or sometimes acute below, often granular within, 12-20  $\times$  2-4  $\mu$ , issuing in a whitish tendril; sporophores papilliform, rather short.

On dead fallen leaves of *Ilex Aquifolium*, rarely on dead twigs of the previous year. Very common, but the larger stromata are frequently sterile. The pycnidial stage of *Phacidium multivalve* K. & S.

Many, if not all, of our British specimens placed under *Phoma Ilicis* Desm. are the smaller pycnidia of *C. phacidoides*, the larger ones not having yet been formed on that leaf. My

ground for stating that these two forms of pycnidia belong to the same species is: (1) that they bear exactly similar spores; and (2) that they both continually occur together on the same leaf, an unbroken series being then often traceable from the largest to the smallest. One can, of course, find pycnidia bearing allantoid spores, and others bearing ovoid spores of various sizes, on the same leaves of Holly, often in company with the *Ceuthospora*, but in that case no one would dream of suggesting that there is any connection between them.

#### CYTOSPORINA.

Stroma *Valsa*-like, verruciform or effused, on bark or wood, hard, brown-black outside, paler within. Pycnidia more or less immersed, even emerging completely, plurilocular or pseudo-locellate, opening by one or more ostioles. Spores filiform, curved, hyaline, continuous, over  $12\mu$  long.

The best known species are pycnidial stages of *Eutypa* and *Cryptosphaeria*, and therefore are distinct from *Cytospora* more deeply than is implied in mere length of spore. Others are assigned to *Eutypella*, but possibly in error.

**Cytosporina Acharii** Grove, comb. nov. *Cytospora Acharii* Sacc. Syll. iii. 267. Allesch. vi. 566. Died. l.c. p. 369.

Stroma widely effused, thin, black. Pycnidia partly immersed, seated on the wood, convex on a roundish base, unilocular, black, usually densely aggregated, with thick walls, opening by a narrow pore or slit. Spores filiform, curved or lunate,  $13-15\mu$  long, at length issuing in whitish tendrils; sporophores fasciculate, about as long.

On decorticated branches, especially of *Acer*. Not uncommon. The pycnidial stage of *Eutypa Acharii* Tul. The pycnidia usually appear before the perithecia.

*Distrib.* Europe, N. America.

**Cytosporina flavovirens** Grove, comb. nov. *Cytospora flavovirens* Sacc. Syll. iii. 268. Allesch. vi. 566. Died. l.c. p. 331.

Stroma thick, more or less effused, of a greenish-yellow colour within, but nearly black outside. Loculi totally immersed, very crowded, oblong, about  $\frac{1}{2}$  mm. diam., with thick fleshy indefinite greenish-yellow walls, opening by an inconspicuous pore or slit. Spores linear-filiform, curved or lunate,  $30\mu$  long or more, nearly sessile, agglutinated, expelled in whitish tendrils which become darker with age.

On bark or wood of *Acer*, etc. Rather common. The pycnidial stage of *Eutypa flavovirens* Tul.

It has been recorded on many hosts (e.g., *Fagus*, *Quercus*), and can be recognised at once, on sectioning, by the peculiar colour of its stroma, which is that of flour of sulphur mixed with a little powdered charcoal. The pycnidia, which are not abundant, come before the perithecia.

*Distrib.* Europe, N. America.



**Cytosporina millepunctata** Sacc. Syll. iii. 602. Allesch. vi. 953. Died. l.c. p. 547.

Stromata scattered, subcutaneous, minute, subglobose, pallid, mostly unilocular. Spores filiform-cylindric, variously curved, 40–48 (or even 60)  $\times$  1  $\mu$ , issuing in pinkish or yellowish tendrils; sporophores very short or none.

On dead fallen branches of *Fraxinus excelsior*. Rather common. Nov., Dec. The pycnidial stage of *Cryptosphaeria millepunctata* Grev. Scot. Crypt. Flor. pl. 201 (1826) = *Sphaeria eunomia* Fr. Syst. Myc. ii. 377 (1823) = *Valsa eunomia* Nits. (not *V. millepunctata* Nits. which is *Cryptosphaeria populina* Sacc.)—The right name would appear to be *Cryptosphaeria eunomia* Fekl. Symb. Myc. p. 212.

Both stages are common on fallen branches and twigs of Ash, but are easily overlooked on account of their minute size and subcutaneous habit. The two stages occur intermixed.

*Distrib.* Germany, Denmark.

#### Doubtful Species.

**Cytosporina hysterioides** Cooke, in Grevill. 1887, xvi. 48. On slender twigs of *Celtis*. Kew Gardens.

This name had better be completely dropped. Cooke's own specimens show that there is no pycnidial wall, and that the pustules are composed of spores measuring 10–12  $\times$  1.75–2.5  $\mu$ .

**Cytosporina notha** Died. Pilz. Brand. p. 545.

On bark of branches of *Acer platanoides* and *A. Pseudoplatanus*. The British specimens appear to be a *Phomopsis*, possibly *Phomopsis notha* Lind, Dan. Fung. p. 422.

**Cytosporina Ribis** Magn. in van Hall, Annal. Mycol. 1903, i. 508. See also Brooks and Bartlett, in Annal. Mycol. 1910, viii. 174, pl. 3, f. 9.

Reported from several English counties from Kent to Hereford, on "collar" and roots of *Ribes Grossularia*. None of the specimens seen answered to the description, and the spores figured by Brooks and Bartlett have distinctly the "walking-stick" shape of a *Phomopsis* B-spore.

**Cytosporina Staphyleae** Cooke, in Grevill. 1887, xvi. 48.

On twigs of *Staphylea pinnata*, Kew Gardens. This does not belong to *Cytosporina*.

**Cytosporina stellulata** Sacc. Syll. iii. 602.

On branches of *Ulmus campestris*.

Said to be the pycnidial stage of *Eutypella stellulata* Nits. But this is improbable: the spermogone of this species should be *Cytospora stellulata*. The only specimens I have seen which could have been placed under *Cytosporina stellulata* were the B-spores of a *Phomopsis*, for in the same pycnidia could be found the ordinary A-spores of that genus.

# XXXVIII.—NEW EUPHORBIACEAE FROM THE MALAY PENINSULA.

H. N. RIDLEY.

In working out the Euphorbiaceae for the Flora of the Malay Peninsula, I find several species as yet undescribed, of these I herewith give descriptions.

**Cleistanthus albidiscus** Ridl. nov. sp.; affinis *C. parvifolio* Hk. f., sed in venatione foliorum, venis arcuantibus, bracteis hirtis, petalis integris differt.

*Arbor* parva glabra. *Folia* lanceolata, acuminata, basibus obtusis, tenuiter coriacea, subtus glaucescentia, nervis 10-paribus tenuissimis, intra margine arcuantibus, 4.5 cm. longa, 2 cm. lata; petioli 2 mm. longi vel breviores. *Stipulae* setaceae basibus dilatatis. *Flores masculi* ignoti. *Flores feminei* in glomerulis bractearum rufarum hirtarum, 1 vel 2, pedicellis filiformibus 4 mm. longis. *Sepala* valvata, 3, lanceolata. *Petala* 3, multo majora, ovata, apicibus rotundatis integris, 3 mm. longa. *Discus* cylindricus, albus, papillosus; ovarium glabrum ferme omnino tegens. *Fructus* ignotus.

Terutau Island, Telok Hudang, Haniff 1069.

Allied to *C. parvifolius* Hook. fil., of which only fruiting specimens are known. It differs, however, in the venation of the leaves, which is not inarching in *C. parvifolius*, in which the nerves break up into small branches before reaching the leaf edge. The bracts in the latter are not hairy, and the petals are toothed.

**Actephila aurantiaca** Ridl. nov. sp.; affinis *A. javanicae* Miq., sed in caule brevi vix ramoso, foliis latis undulatis crenatis, floribus aurantiacis differt.

*Frutex* parvus, glaber, bipedalis. *Folia* tenuiter coriacea, obovata vel oblanceolata vel elliptica, breviter obtusa marginibus crenulatis, nervis 10-paribus arcuantibus in arcubus latis marginibus distantibus, reticulationibus latis, 10 ad 17 cm. longa, 7 ad 9 cm. lata; petioli 5 ad 10 mm. longi. *Flores* parvi, vix 6 mm. lati, aurantiaci, in glomerulis in caule. *Sepala* 5, linearia, oblonga. *Petala* late obovata, denticulata. *Discus* lobis 5 planis, capillis albis tectus; ovarium conicum, glabrum. *Capsula* subglobosa, triloba, 1 cm. longa, in pedunculo 2 cm. longo.

Kelantan, on the Kelantan River at Chaning, in woods on sandy soil, Ridley.

**Actephilopsis** Ridl. nov. gen.; affinis *Actephilae* Blume, sed ovulis in loculis singulis distinguitur.

*Frutex* glaber, alabastris exceptis. *Folia* alterna, elliptica cuspidata, marginibus undulatis crenulatis, petiolis brevibus. *Flores masculi* minuti, pedicellati, in racemis densis brevibus axillaribus. *Bractee* minutae, ovatae, acutae. *Sepala* 5, oblonga. *Petala* 5, latiora, paullo longiora. *Discus* lobis 5 sub-quadratis.



*Stamina* 3, conniventia, antheris oblongis, subsessilibus. *Pistillidium* minutum, subaequilongum. *Flores feminei* in raceme terminali, singuli in axillis bractearum lanceolatarum foliacearum. *Pedicelli* longiusculi, superne incrassati. *Sepala* 5, ovata. *Petala* 5, longiora, carnosula obtusa. *Ovarium* glabrum, triloculare, ovulis in loculis singulis; styli erecti, simplices, brevissimi. *Capsula* profundis triloba, suborbicularis. *Semina* in loculis singulis, rotundatis, flavis, brunneo marmoratis.

Species unica.

***Actephilopsis malayana* Ridl. nov. sp.**

*Frutex* glaber, ramis cortice pallido. *Folia* tenuiter coriacea, elliptica, cuspidata, basi gradatim attenuato, marginibus undulatis crenulatis, nervis 10 ad 11-paribus gracilibus, 16 cm. longa, 9 cm. lata; petioli 1 ad 3 cm. longi. *Flores masculi* minuti, pedicellis filiformibus 4 mm. longis, in racemis brevissimis crassis in axillis foliorum et ramorum. *Bracteae* minutae, persistentes, ovatae, acutae. *Flores feminei* in racemis 19 cm. longis. *Bracteae* lineari-lanceolatae, foliaceae, 2 cm. longae, 5 mm. latae. *Pedicelli* superne dilati, 15 mm. longi. *Capsula* glabra, triloba, subrotunda, 15 mm. lata.

Pahang, Kwala Tembeling, in woods, Ridley 2300. Perak, Gunong Kerbau, Haniff 1611. Penang, Ayer hitam, at foot of hill, Curtis 674.

This plant has in many points resemblances to the genus *Actephila* but differs in having the ovules solitary in the ovary-cells. The male flowers are borne on short thick racemes clustered in the axils of the branches, and in leaf-axils and are very minute, while the female flowers are solitary in the axils of leaf-like bracts in a terminal raceme. They are very much larger than the males and have a dilated pedicel very much as in *Actephila*. I cannot find any genus of the one-ovuled *Euphorbiaceae* which bears any resemblance to it, and it certainly seems to have an affinity with *Actephila*, but Lieut.-Col. Gage and I myself cannot find more than one ovule in each ovary-cell or traces of a second, but I have only seen one or two female flowers. I should suggest that it really belongs to the section *Phyllanthaeae* but is aberrant in possessing only one ovule in each ovary-cell.

***Andrachne australis* Dene.**

The plant figured and described by Hooker in *Icones Plantarum* t. 1704 as *A. fruticosa* Linn. from Perak is not that species but *A. australis* Dene.

***Andrachne calcarea* Ridl. nov. sp.;** a ceteris speciebus foliis glabris obtusis basibus obtusis distinguitur.

*Herba* caule simplice raro ramoso, pubescente basi sublignoso. *Folia* membranacea, glabra, costa inferiore excepta minute pubescente rarius subtus parce hirta, elliptica vel elliptico-lanceolata, obtusa mucronulata, basi breviter angustato, nervis obscuris 4-paribus, 6 cm. longa, 2.6 cm. lata; petioli pubescentes,

1.5 cm. longi. *Flores* 1 vel 2 in axillis superioribus; masculi 2 mm. lati, pedicellis capillaribus 4 mm. longis. *Sepala* hirta, oblonga. *Petala* angusta, lanceolata. *Stamina* 5, filamentis gracilibus. *Discus* lobis linearibus profunde bifidis. *Pistillodium* mediocre. *Flores feminei* 4 mm. latae. *Sepala* ovata, extus hirta. *Ovarium* glabrum; styli 3, bifidi. *Capsula* 3 mm. lata, hirta. *Semina* semi-oblonga, grisea, transversim rugosa.

Selangor, at the top of the Batu Caves, on limestone rock, Ridley 8203. Lankawi Islands, Dayong Bunting, Robinson 6201. Siam, Kau Koh Suwan near Lampan, Annandale 1835.

Very distinct in its nearly glabrous blunt leaves, very shortly narrowed at the base, and its simple stem.

**Andrachne hirta** Ridl. nov. sp.; ab *A. fruticosa* Linn. foliis parvis hirtis distinguitur.

*Fruticula* ramosa, 28 cm. alta, undique hirsuta. *Folia* elliptico-lanceolata, obtusa vel subacuta, basi brevissime cuneata, undique dense hirta, nervis 4-paribus tenuibus, 2.5 ad 3 cm. longa, 1 ad 1.5 cm. lata; petioli hirti 1.5 cm. longi. *Flores masculi* minuti in pedicellis hirtis capillaribus 5 mm. longis. *Sepala* oblonga, obtusa, hirta, 1 mm. longa. *Petala* sepalis multo minora, spathulata, glabra. *Stamina* 5, filamentis crassiusculis superne attenuatis. *Discus* lobis linearibus acutis bifidis. *Pistillodium* breve oblongum, obtusum. *Flores feminei* 4 mm. lati. *Sepala* coriacea, extus hirta, oblonga. *Petala* breviora. *Capsula* 2 mm. lata, hirta, semiglobosa, apice plano. *Semina* grisea, transversim rugosa.

Perlis, Tebing Tinggi, near Kanga, Ridley 14883.

Very distinct in its small, hairy leaves and its general hairiness.

**Phyllanthus campanulatus** Ridl. nov. sp.; a *P. frondoso* Wall. foliis coriaceis glaucescentibus floribus majoribus campanulatis racemosis differt.

*Frutex*. *Folia* subcoriacea, lanceolata, acuminata, basibus angustatis, glabra subtus glaucescentia, nervis 6-paribus inconspicuis, 8.2 cm. longa, 2.2 cm. lata; petioli brevissimi. *Flores masculi* circiter 6, in racemis 2 mm. longis axillaribus. *Bractaeae* parvae, lanceolatae, acuminatae. *Pedicelli* graciles, 2 mm. longi. *Sepala* 6, exteriora quam interiora angustiora, oblonga, obtusa, 2 mm. longa. *Stamina* 3, filamentis connatis, antheris liberis erectis lanceolatis obtusis. *Discus* lobis 6, obovatis latis denticulatis. *Flores feminei* et fructus ignoti.

Kedah, Kedah Peak, at 2000 feet alt., Bell & Haniff.

This is allied to the common *P. frondosus* Wall. but the leaves are more coriaceous and glaucescent beneath, the flowers are twice as large and campanulate in form, with distinct pedicels and borne on a very short stout raceme. In *P. frondosus* the minute flowers are nearly sessile in axillary fascicles.

**Phyllanthus erythrocarpus** Ridl. nov. sp.; affinis *P. dalbergioides* Wall., sed arborescens, foliis hirtis basibus latis.



*Arbor* ramulis pubescentibus. *Folia* submembranacea, ovata, obtusa, basibus rotundatis vel subemarginatis, superne glabra, subtus in nervis pubescentia, costa dense pubescente, nervis 7-paribus, 2 ad 4 cm. longa, 2 ad 4 cm. lata; petioli 3 mm. longi, hirti. *Stipulae* lanceolatae, acuminatae, persistentes, pubescentes. *Flores* in glomerulis in ramis lateralibus tenuibus circiter 9 cm. longis pubescentibus. *Bractae* plures, lanceolatae, acuminatae. *Flores masculi* minuti, in pedicellis brevibus pubescentibus. *Sepala* 5, imbricata, oblonga, obtusa, extus pubescentia. *Stamina* 5, antheris oblongis inter loculis profunde canaliculatis, filamentis liberis brevibus. *Discus* annularis lobulatus. *Capsula* subsessilis, globosa, rubra, glabra, extus carnea, 6 mm. longa, stylis minutis coronata. *Semina* 4, atra, triquetra.

Selangor, Batu Caves, in woods on limestone rocks, March 1915, Ridley.

Allied to *P. dalbergioides* Wall., but a tree, and with hairy shoots and leaves, the latter broad-based and often slightly emarginate or retuse at the base.

**Phyllanthus Hullettii** Ridl. nov. sp.; affinis *P. gomphocarpus* Hk. f. sed foliis minoribus confertis oblongis differt.

*Frutex* ramis rufo-furfuraceis. *Folia* membranacea-coriacea, glabra, oblonga, subacuta oblique, basibus angustatis, subtus glaucescentia, nervis inconspicuis 7-paribus, 3 cm. longa, 1 cm. lata; petioli 1 mm. longi rufo-furfuracei. *Stipulae* brevissimae, lanceolatae, acuminatae, rufo-furfuraceae. *Flores masculi* 2 mm. lati, atro-rubentes, pedicellis 3 mm. longis. *Sepala* 4, ad basin connata, ovata, rubra, fimbriata, fimbriis albis, extus hirta. *Stamina* 4, filamentis brevissimis, antheris subglobosis. *Flores feminei* rubri, 5 mm. lati, pedicellis furfuraceo-hirtis 14 mm. longis. *Sepala* 5, oblongo-lanceolata, obtusa, fimbriata, costa media superne elevata, rubra. *Discus* lobis 5 carnis oblongis subquadratis truncatis. *Ovarium* semiglobosum, canaliculis 6; styli breves recurvi 6.

Malacca, at the top of Mount Ophir, Hullett 752 (in Herb. Kew).

This is evidently allied to *P. gomphocarpus* Hook. fil., of which it has the peculiar red scurf on the branches, petioles and inflorescence. The habit of the plant recalls that of *P. frondosus* Wall. The much smaller blunt, close leaves distinguish it readily from *P. gomphocarpus*.

**Glochidion glaberrimum** Ridl. nov. sp.; a *G. brunneo* Hk. f. in cymis sessilibus, stylo multo longiore, capsula minore differt.

*Frutex* vel *arbor* 10 ad 15 pedes alta. *Folia* oblique oblonga, obtuse breviter acuminata basibus breviter angustatis, subcoriacea, glabra, nervis inconspicuis 9-paribus, 10 cm. longa, 3.2 cm. lata; petioli 5 mm. longi. *Flores masculi* ignoti. *Flores feminei* in cymis sessilibus pauci, breviter pedicellati, glabri. *Sepala* coriacea, ovato-lanceolata, acuminata. *Ovarium* glabrum, aequilongum; stylus cylindricus, apice dilatato sepalis

multo superans; stigmata 3, ovata, obtusa. *Capsula* orbicularis, haud lobata, apice plano, glabra, costata, 7 mm. lata.

Perlis, Kanga, *Ridley* 14899.

Allied to *G. brunneum* Hook. fil., but the cymes are sessile, not peduncled, the style much longer, and the fruit round with a flattened top and smaller.

***Glochidion pedunculatum*** *Ridl.* nov. sp.; a *G. brunneo* Hk. f. in floribus hirtis, cymis pedunculatis differt.

*Arbor* ramulis glabris. *Folia* membranacea, oblique oblonga, breviter abrupte obtuse cuspidata, basibus cuneatis, glabra, nervis 8-paribus tenuibus, 12 cm. longa, 4.8 cm. lata; petioli 5 mm. longi. *Cymae* axillares pubescentes, in pedunculis 1 cm. longis glabris. *Stipulae* et bracteae lanceolatae, acuminatae, hirtae, 3 mm. longae; bracteae breviores. *Flores masculi* ignoti. *Flores feminei* pauci, congesti, pedicellis brevissimis. *Sepala* 6, oblonga, coriacea, hirta, 2 mm. longa. *Ovarium* semi-ovoideum, hirtum; stylus sepalis aequilongus, conicus, hirtus; stigma pulvinare lobatum. *Capsulae* ignotae.

Singapore, Bukit Timah, *Ridley* 8952.

This is allied to *G. brunneum* Hook. fil. but the flowers are hairy.

***Glochidion stylosum*** *Ridl.* nov. sp.; a *G. sericeo* Hk. f. foliis subtus glaucescentibus, nervis hirtis, stylis longioribus differt.

*Arbor* parva, partes juvenes hirti. *Folia* coriacea, haud glauca, oblique lanceolato-oblonga, acuminata, basibus latis, superne glabra costa hirta excepta, subtus nervis 7-paribus et costa hirtis, 4.5 cm. ad 8 cm. longa, 1.5 ad 3.5 cm. lata; petioli 3 mm. longi, hirti. *Flores masculi* pauci, axillares, fasciculati, in pedicellis 3 mm. longis pubescentibus. *Bracteae* ovatae, pubescentes. *Sepala* oblonga, obtusa, subaequalia, dorsis hirtis. *Flores feminei* sessiles. *Sepala* ovata, acuta, pubescentia. *Ovarium* dense hirtum; styli filiformes, 3, glabri, 6 mm. longi. *Capsula* rotundata, puberula, 5 mm. longa. *Semina* subreniformia, dorsis rotundatis rubra.

Selangor, Semangkok Pass at 4000 feet alt., *Ridley*.

Allied to *G. sericeum* Hook. fil. but the leaves are glaucescent or silky-pubescent on the back and hairy on the nerves, more coriaceous and lanceolate in shape, and the styles much longer.

***Glochidion trilobum*** *Ridl.* nov. sp.; *G. microbotryde* Hk. f. affinis sed pubescens, pedunculis femineis multo longioribus pedicellis brevibus seminibus minoribus.

*Arbor*, ramulis tenuiter pubescentibus. *Folia* membranacea vel subcoriacea, oblique oblongo-lanceolata, obtuse acuminata, superne glabra, costa pubescente excepta, subtus costa et nervis 7-paribus tenuibus tenuiter pubescentibus, 10 ad 12 cm. longa, 4 ad 6 cm. lata; petioli 5 mm. longi, pubescentes. *Flores masculi* ad 8, in fasciculis axillaribus parvis, pedicellis gracilibus pubescentibus. *Sepala* 3, exteriora linearia oblonga obtusa recurva, interiora 3 glabra patentia similia. *Antherae* breviores



in conum connatae. *Flores feminei* ignoti. *Capsulae* in fasciculis axillaribus ad 12 in pedunculis pubescentibus brevibus, pedicellis gracilibus pubescentibus 5 mm. longis, obcordatae, trilobae apicibus depressis, pubescentes, 4 mm. latae; stylo brevi pulvinato; sepalis brevibus oblongis. *Semina* 3, rubra, nitentia, dorsis rotundatis.

Singapore, Botanic Gardens, in the forest, *Ridley* 8440. Negri Sembilan, Tampin, *Burkill* 7004.

It differs from the allied *G. microbotrys* Hook. fil. which is quite glabrous, in the female peduncles which are much longer, the pedicels quite short, and the seeds also much smaller.

***Drypetes pendula* Ridl. nov. sp.;** a ceteris speciebus in foliis maximis oblongis crasse coriaceis ramis pendulis differt.

*Arbor* 40 ad 60 pedalis ramis longissimis pendulis. *Folia* coriacea, crassa, rigida, lineari-oblonga, subacuta, basibus inaequaliter cordatis, nervis 20 ad 30 paribus elevatis, 28 ad 56 cm. longa, 10 ad 13 cm. lata; petioli crassi, 1.5 cm. longi. *Flores masculi* in ramis in fasciculis densis 4 cm. latis multifloris, pedicellis crassis 1.5 cm. longis. *Sepala* 5, glabra, rotundata, concava. *Stamina* plurima, circum discum planum. *Stigmata* tri- vel bifida. *Fructus* globosus, 4 cm. in diametro, aurantiacus, subtrigonus, parce tomentosus.

Singapore, Garden Jungle; Selitar, *Ridley*. Selangor, Kuala Lumpur. Perak, Larut, *Kunstler* 3540. Penang Hill, *Maingay* 1453.

This very striking tree seems to have been referred by Hooker in Fl. Brit. Ind. 5 : 341 to *Cyclostemon longifolius* Bl. from which it is quite distinct. Pax in the Pflanzenreich has quite overlooked it. It is remarkable for its very long pendulous branches, and very large, thick, oblong, dark green shining leaves, bright red when young.

***Drypetes riparia* Ridl. nov. sp.;** a *D. sumatrana* Miq. in foliis majoribus integris, fructu majore flava-pubescente differt.

*Arbuscula*, partibus juvenibus pubescentibus, ramis vetustis cortice albo tectis. *Folia* tenuiter coriacea, glabra, integra, lanceolata, acuminata, basibus angustatis inaequilateris, nervis 10-paribus tenuibus, paullo subtus elevatis, inter se arcuantibus, nervulis cum reticulationibus aequae elevatis conspicuis, 16 cm. longa, 4 cm. lata; petioli rugosi, parce puberuli, 6 mm. longi. *Flores* ignoti. *Fructus* oblongo-globosus, bisulcatus, bilocularis, 2 cm. longus et latus, pubescentia flavescente tectus, pedicello validulo 2 mm. longo, sepalis rotundatis hirtis.

Kelantan, Kwalla Lebir river near the rapids, Jeram Panjang, on the banks among rocks, *Ridley*.

A willow-like tree allied to *D. sumatrana* Miq. but with larger, entire, not crenulate, leaves and larger yellow pubescent fruit. I could find no flowers on any of the trees and have seen no other specimens.

**Antidesma hirtellum** Ridl. nov. sp.; prope *A. longipede* Hk. f. sed drupis multo minoribus, pedicellis gracilibus multo longioribus.

*Arbor* parva ad 15 pedes alta, ramulis et partibus juvenibus flavescente-hirtis. *Folia* tenuiter coriacea, superne glabra costa pubescente excepta, subtus subglabra, elliptica, cuspidata, basibus inaequilateralibus obtusis, nervis 11 ad 12-paribus tenuibus, 19 cm. longa, 9 cm. lata; petioli hirti, 5 mm. longi. *Stipulae* lanceolatae, caudatae, hirtae, 1.5 cm. longae. *Flores* ignoti. *Drupae* in racemo simplici 45 cm. longo pubescente, ovoideo-oblongae, complanatae, sparse hirtae, reticulationibus paucis, stigmatibus terminalibus. *Bractaeae* minimae, lanceolatae, hirtae. *Pedicelli* gracillimi, remote 1 cm. longi. *Sepala* ovata, acuta, dense hirta.

Perak, Bujong Malacca, in woods on the hills, *Ridley* 9581.

Allied to *A. longipes* Hook. fil., but the fruits are very much smaller.

**Croton calcicola** Ridl. nov. sp.; a ceteris speciebus tomento stellato-hirsuto distinguitur.

*Frutex* 2.5 m. alta, ramis dense stellato-hirsutis. *Folia* membranaceo-chartacea, superne glabra, costa excepta, subtus stellato-hirsuta (folia juvenilia undique hirsuta) elliptico-oblonga, acuta, basibus angustatis obtusis breviter bilobis, marginibus-minute glanduloso-denticulatis, nervis 12- ad 13-paribus gracilibus subtus elevatis, 19 ad 24 cm. longa, 6.5 ad 8 cm. lata; petioli dense stellato-hirsuti, 4 cm. longi. *Flores masculi* ignoti. *Flores feminei* in racemo erecto 20 cm. longo dense stellato-hirsuto, pedicellis crassis hirsutis 3 mm. longis. *Sepala* ovato-triangularia, extus hirta, 3 mm. longa. *Ovarium* dense hirsutum; styli graciles, bifidi, juxta bases glabri. *Capsula* 1 cm. longa, coccis tenuibus lignosis extus dense pubescentibus. *Semina* ovoidea, apicibus rotundatis, nigra, 5 mm. longa.

Selangor, Kanching, on limestone rocks, *Ridley*. Borneo, Sarawak, *Beccari* 3134.

This shrub is distinguished from all Malay peninsula species by its soft dense tomentum of stellate hairs which covers all of it except the inner surface of the sepals, the styles and the upper surface of the leaves.

**Trigonostemon salicifolius** Ridl. nov. sp.; affinis *T. indico* Muell. Arg. sed foliis angustis lanceolatis acuminatis, disco brevissimo differt.

*Frutex* glabra, 1 m. alta. *Folia* coriacea, anguste lanceolata, longe-acuminata, basibus paullo angustatis, nervis tenuibus inconspicuis late arcuantibus horizontalibus 14-paribus, 14 ad 18 cm. longa, 2 cm. lata; petioli graciles 2 ad 4 mm. longis. *Racemi* axillares, 5 cm. longi. *Flores* dissiti, pauci, 6 mm. lati, pedicellis crassiusculis 3 mm. longis. *Bractaeae* parvae, ovatae, obtusae. *Flores masculi*; sepala rotundata, coriacea, marginibus ciliatis; petala multo longiora, lata, rotundata, integra, kermesino-purpurea, carnosa; staminum columna brevi;



antherae 5, oblongae, apicibus bifidis; discus brevis cupulatus. *Flores feminei*; sepala brevia coriacea; ovarium trilobum, pubescens; styli corniformes, breves, bifidi. *Capsula* oblongo-ovata, tenuiter lignosa, griseo-atra, pustulata, 6 mm. longa.

Selangor, Kanching, on limestone rocks, *Ridley*.

Allied to *T. indicus* Muell. Arg. but very distinct in its narrow leaves and very short disc.

**Macaranga quadricornis** *Ridl.* nov. sp.; affinis *M. cornuta* Muell. Arg. et *M. Hosei* Hk. f. sed cornubus capsulae brevibus, folioque trilobo differt.

*Arbor* parva. *Folia* magna, 28 cm. longa, triloba, peltata, lobis lanceolatis acuminatis glanduloso-denticulatis, lobo medio 14 cm. longo, 10 cm. lato, nervis 12; lobis lateralibus 9.5 cm. longis 6 cm. latis, nervis cum costa subtus hirtis, nervulis transversis parallelis, elevatis; petioli 14 ad 18 cm. longi utrinque incrassati. *Flores* ignoti. *Fructus* in glomerulis in paniculis ramis tribus crassis 7 cm. longis, ramis 2 cm. longis glomerulis 2 cm. in diametro. *Capsulae* sessiles, glabrae, turbinatae, 15 mm. latae, apicibus applanatis, cornubus .4 glandulosis brevibus ad angulos. *Sepala* lata rotundata. *Semina* ellipsoideo-globosa, arillo rubro, 5 mm. in diametro.

Selangor, Semangkok pass, Bukit Telaga, in woods in the mountains, *Ridley*; Telok reserve, Klang, *Burkill* 6557.

Apparently allied to *M. cornuta* Muell. Arg. which however has the horns of the fruit as long as the body of it, and also allied to *M. Hosei* Hook. fil. but the leaves are trilobed. The fruits are much larger than those of *M. triloba* Muell. Arg.

**Macaranga robiginosa** *Ridl.* nov. nom. This common lowland tree in the Malay peninsula was originally called "*Rottlera montana* Heyne, in Sched," by Baillon, *Études Gén. Euphorb.* 230 (1858), but Heyne's *Rottlera montana* in Sched. Wallich's Catalogue 7833, is not this plant at all but a Nepal species allied to *Mallotus philippinensis*. The specimen of the Malay peninsula plant in Wallich's herbarium is numbered 7835, and the ticket merely says Penang. Mueller Arg. in DC. Prod. xv. 2, 1005 followed Baillon and called it *M. javanica* var. *montana* Hook. In the Flora of British India v. 451, it is called *M. javanica* from which species it differs entirely in the large toothed bracts, which are smaller and entire in *M. javanica*. Pax, *Pflanzenreich*, iv, 147, vii, 321 (1914) calls it *Macaranga montana* (Heyne) Pax and Hoffman, but it is not Heyne's plant at all. Moreover, *Macaranga montana* Pax is anticipated by *Macaranga montana* Merrill a Philippine plant, *Phil. Journ.* vii. 394 (1912), for which Pax has substituted the name *M. Merrilliana* (*Pflanzenreich* l.c. 334). This latter name must be relegated to a synonym (*M. montana* Merrill being older than *M. montana* Pax), and as Hooker's *Macaranga javanica* var. *montana* has no name, I propose *M. robiginosa* for it in reference to its rusty appearance. Pax refers it curiously to an affinity with *M. populifolia* Muell. Arg. with which it has little in

common. It is allied to *M. javanica* Muell. Arg. and *M. bancana* Muell. Arg.

**Cephalomappa penangensis** Ridl. nov. sp.; a *C. Beccariana* Baill. in foliis majoribus dentatis, capitulis majoribus differt.

*Frutex* magna vel arbor alta ramulis velutino-furfuraceis. *Folia* elliptica vel obovata, cuspidata, tenuiter coriacea, marginibus parce dentatis, nervis 7-paribus subtus elevatis et furfuraceis pubescentibus, nervuli transversis dissitis, 14 ad 19 cm. longa, 6.5 ad 10 cm. lata; petioli 4 cm. longi, velutini, apicibus incrassati. *Paniculae* axillares, 3 cm. longae, stellato-tomentosae. *Capitula mascula* 6 mm. diametro in pedicellis gracilibus 1 cm. longis. *Calyx* turbinatus, 3- ad 5-lobatus. *Stamina* 5, filamentis validulis liberis. *Flores feminei* 2 mm. longi. *Sepala* acuminata. *Stylus* singulus. *Capsula* 1.5 cm. longa, rufo-tomentosa, processibus conico-cylindricis.

Penang, back of West Hill, Curtis 3584 and 1571.

Allied to the only other species *C. Beccariana* Baill. of Borneo, but with much larger toothed leaves and larger flower heads. Curtis describes one of his plants (3584) as a tall tree, the other as a large shrub.

**Tragia laevis** Ridl. nov. sp.; differt a totis speciebus asiaticis in foliis angustis hastatis superne laevibus.

*Suffrutex* scandens involvens, gracilis, pubescens vel capillis urticantibus armata. *Folia* herbacea, deltoideo-hastata, acuminata, mucronulata, basibus cordatis, marginibus integris vel sparse serratis, et ad basin obscure lobatis, superne glabra breviter vel sparse albo-ciliata, subtus in nervis pilis albis urticantibus tecta, nervis 7 a basi et 6 e costa exortis, 6 cm. longa, 3.5 cm. lata; petioli pilis urticantibus muniti, 4 cm. longi. *Racemi* foliis oppositi 2 cm. longi. *Flores masculi* terminales, 3 mm. lati, in pedicellis 3 mm. longis. *Bractaeae* lineares. *Sepala* 3, ovata, velutino-puberula. *Discus* annularis, papillosus. *Stamina* 3, filamentis brevibus crassis; antherae loculis 2 connectivo crasso divulsis. *Flos femineus* ad basin racemi. *Sepala* quam in masculo majora, integra, viridia, oblonga, obtusa, basi angustato, albo-pilosa. *Discus* nullus. *Ovarium* pubescens; stylus crassus, brevis, brachiis 3 carnosius recurvis, papillis crassis in margine superiore munitis. *Capsula* triloba, rufo-brunnea, pubescens, 6 mm. in diametro.

Lankawi islands, Dayong Bunting, H. C. Robinson 6200. Flowers greenish, stings but not badly.

This species is quite unlike any in Asia in its smooth nearly glabrous upper-side of the leaves, which are narrow and hastate.

**Cnesmone subpeltata** Ridl. nov. sp.; differt a *C. javanica* Bl. foliis tenuibus glabris peltatis, racemis et planta tota gracilioribus.

*Suffrutex* virgatus, gracilis, scandens, undique breviter albo-pilosus. *Folia* membranacea, elliptica vel ovata, obtusa, basibus breviter peltatis, marginibus crenulato-sinuatis, superne parce



hirta, subtus hirtiora, praesertim in nervis 4-vel 5-paribus, 5 ad 7 cm. longa, 2·5 ad 5 cm. lata; petioli 4 cm. longi, hirti. *Stipulae* late ovatae, ferme glabrae. *Racemi* gracillimi, hirti, 6 cm. longi. *Bracteae* ovatae, acuminatae, dissitae, 2 mm. longae. *Flores masculi* 4 mm. lati in pedicellis brevibus. *Sepala* 3, ovata, hirta. *Discus* nullus. *Stamina* 3, filamentis brevissimis, loculis antherae connectivo lato utrinque carinato et ad apicem prolongato divulsis. *Flores feminei* non visi. *Capsula* parva, sepalis lanceolatis acutis 6 mm. longis.

Selangor, Batu Caves in thickets, *Ridley*.

This is quite unlike the common species *Cnesmone javanica* Bl. in its much thinner, more glabrous, peltate leaves and more slender racemes.

### XXXIX.—ADDITIONS TO THE FLORA OF THE FALKLAND ISLANDS.

C. V. B. MARQUAND.

In 1912 Mrs. Elinor F. Vallentin presented to Kew a collection of some 930 specimens of plants, including Cryptogams, collected in the West Falkland Islands. Mrs. Vallentin had been a resident in the Falkland Islands for a number of years and her former collections formed the basis of Mr. C. H. Wright's paper published in the Journal of the Linnean Society for 1911 (Vol. xxxix). The later collection was made in 1910 and 1911 and it was during this period that Mrs. Vallentin prepared the beautiful drawings which figure in her work, "Illustrations of the Flowering Plants and Ferns of the Falkland Islands".

In working out the Phanerogams, Vascular Cryptogams and Charophyta a number of interesting species have been met with which were unrecorded hitherto from the Falklands, and several others which confirm earlier records upon which some doubt has been cast by Skottsberg, in his "Botanical Survey of the Falkland Islands", owing to their not having been found during recent years. The present paper gives an enumeration of these additions.

Another interesting collection which was made by Dr. A. W. Hill in November 1902 and includes species from near Port Stanley, East Falklands, has also recently been determined. This collection contains a specimen of *Senecio vulgaris* L., which has hitherto been unrecorded, but it seems probable that it is a recent introduction, possibly existing only as a "casual".

With the exception of Skottsberg, who traversed the Islands in one or two directions, most of the collections so far made in the Falklands have been from the neighbourhood of the coast. The majority of the specimens in Mrs. Vallentin's collection came from the districts around Shallow Bay and Byron Sound.

Hooker recorded 125 species in 1847, Wright listed 156 species in 1911, while 163 was the total included by Skottsberg in his

work cited above which was published in 1913. In Mrs. Vallentin's last collection from a small area in the West Falklands no less than 135 species are represented. In all probability more extensive botanizing, especially of parts of the northern promontory of the West Island and on the hills inland which have not been explored botanically, would add more species to the list which is now brought up to a total of 176.

Some of the species enumerated below have almost certainly been introduced into the Islands in recent times, but this is unlikely in the case of others such as the two Filices, and an extension of their range of distribution to this Southern Archipelago is undoubtedly interesting.

Those species hitherto unrecorded from any part of the Falkland Islands are marked † in the following list. All the localities are in the West Islands except where otherwise stated.

***Draba falklandica* Hook. fil.**

Close to the beach by Crooked Inlet. (Confirmation of doubtful record.)

† ***Medicago minima* Lam.**

Dumore Head.

† ***Geranium intermedium* L.**

Shallow Bay and Byron Sound.

† ***Erodium cicutarium* L'Hérit.**

Fox Bay. (There is, however, a specimen in the Kew Herbarium from the Islands, but its precise locality is not stated, *L. H. Firmin*, November 1896.)

† ***Gnaphalium luteo-album* L.**

West beaches, Shallow Bay.

† ***Senecio vulgaris* L.**

Near Shallow Bay, *E. F. Vallentin*; East Falklands, near Port Stanley, *A. W. Hill*. (Probably a recent introduction.)

† ***Ornithogalum caudatum* Ait.—*Isolepis magellanica* Gaud. I. *pygmaeus* Kunth var. *brevis* Brongr.**

Lake Salivan near Fox Bay. Also an earlier specimen exists in the Kew Herbarium Coll. *E. F. Vallentin*, but without exact locality.

† ***Potamogeton linguatus* Hagström.**

Fish Creek Stream, Shallow Bay; Pond, Port North; Teal River Pond.

***Scirpus riparius* Presl.**

Excellent specimens of this fine species, which is new to the West Falklands, were obtained in profusion in one locality. It is recorded by Skottsberg from one locality also in the East Falklands, and there very rare.

***Uncinia brevicaulis* Thours var. *maclovianus* (Gaud.) Kuck.**

Confirmation of Gaudichaud's old record.

† *Avena fatua* L.

Valley near Shallow Bay Settlement; growing in profusion. Doubtfully introduced.

† *Phleum pratense* L.

Probably introduced, no precise locality specified.

† *Hordeum jubatum* L.

St. George's Bay.

† *Scolopendrium vulgare* Sm.

Cave, Mount Phelomel, Chartres.

† *Gymnogramme leptophylla* Desv.

Carcass Island.

† *Nitella opaca* Agardh.

Shallow Bay Pond.

Specimens of *Nitella* from two other localities may possibly belong to another species, but owing to the absence of oogonia and antheridia they could not be determined with certainty.

## XL.—DECADES KEWENSES

### PLANTARUM NOVARUM IN HERBARIO HORTI REGII CONSERVATORUM.

#### DECAS CVIII.

1071. *Orophea salacifolia* Hutchinson [Anonaceae—Miliuseae]; affinis *O. hastatae* King, sed foliis breviter et abrupte acuminatis, floribus subsolitariis fere sessilibus differt.

*Arbor* parva; ramuli leviter flexuosi, demum glabri, internodiis 1·2 cm. longis. *Folia* late oblongo-elliptica, breviter et abrupte acuminata, basi rotundata, 8–10 cm. longa, 4–5 cm. lata, chartacea, opaca, glabra; nervi laterales utrinsecus 8, a costa sub angulo 55° abeuntes, marginem versus evanidi; petioli circiter 3–4 mm. longi, parce pubescentes. *Flores* subsolitarii, fere sessiles, axillares. *Sepala* late triangularia, acuminata, 2·25 mm. longa et lata, appresse pilosa. *Petala* exteriora sepalis similia sed duplo longiora, extra pilosa, interiora paullo longiora, unguiculata, superne conniventia. *Antherae* curvatae, connectivo brevissime producto. *Carpella* glabra. *Fructus* non visus.

ANDAMAN ISLANDS. Betapuo valley, 1 Apr. 1916, C. E. Parkinson 1156.

1072. *Calliandra confusa* Sprague et Riley [Leguminosae—Ingeae]; affinis *C. calothyrsos* Meissn., quacum hucusque confusa, foliolis pro rata multo angustioribus conspicue haud obscure 1-nerviis, calyce satis dentato differt. "

*Arbor* 4–6 m. alta. *Rami* exstantes fertiles, recti, striati, glabri vel glabrescentes, 7 mm. diametro 4 dm. infra apicem.



*Folia* circiter 1·7 dm. longa, rhachi continue subalata glabra; pinnae circiter 15-jugae, 1-1·3 cm. remotae, rhachillis superne puberulis; foliola 50-60-juga, linearia, recta, apice obtusa vel subacuta, basi truncata, costa utrinque conspicua, 6-8 mm. longa, 1-1·5 mm. lata, glabra, margine appresse-ciliolato excepto. *Inflorescentia* elongata, 2-3 dm. longa. *Bractae* lanceolato-lineares, obtusae, conspicue striatae, circiter 8 mm. longae, 1 mm. latae, glabrae, leviter ciliolatae. *Pedunculi* gemini, 8 mm. longi, glabriusculi; pedicelli 3-4 mm. longi. *Alabastra* globosa. *Calyx* inaequaliter 5-dentatus, 1·5-2 mm. longus, glaber, dentibus late triangulatis obtusis, sinibus circiter 0·75 mm. altis. *Petala* (primo ad medium coalita mox libera) oblongo-lanceolata, obtusa vel subacuta, 5 mm. longa, fere 2 mm. lata, glabra. *Stamina* 4 cm. longa, inferne in tubum 1·5 mm. longum coalita. *Ovarium* basi annulo crasso carnosio 1 mm. alto cinctum, quadrangulatum, brevissime stipitatum, 3 mm. longum, glabrum, 10-ovulatum. *Legumen* circiter 8 cm. longum, 5-6 mm. latum, in basin gradatim angustatum, apice oblique cuspidatum, appresse ferrugineo-pilosum, marginibus valde incrassatis.—*Anneslia Calothyrsus* Donnell Smith Enum. Pl. Guat. i. 10 (1889), non *Calliandra calothyrsus* Meissn. *C. grandiflora* Hemsl. Biol. i. 357, partim, non Benth.

CENTRAL AMERICA. Guatemala: Alta Vera Paz; Cobán, 1200 m., *Tuerckheim* 690 (type in Herb. Kew); llanos at base of Volcan de Fuego, *Salvin and Godman* 210; Retaluleu, *Bernoulli and Cario* 1253.

*Calliandra calothyrsus* Meissn. was discovered by Kegel in 1846, in woods by the Saramacca River, near Maripaston-kreek, Surinam, and does not appear to have been collected since (Pulle, Enum. Vasc. Pl. Surinam, 205; 1906). It is described as having oblong obscurely 1-nerved leaflets, 2 lin. long and hardly  $\frac{2}{3}$  lin. broad, and a very shortly 5-toothed calyx, characters which definitely exclude the Guatemalan species.

1073. *Calliandra similis* *Sprague et Riley* [Leguminosae-Ingeae]; similis *C. confusae* *Sprague et Riley*, sed pinnis foliolisque paucioribus et minoribus, rhachi inflorescentiae hirsuta, alabastris obovoideis haud globosis, annulo perigyno tenui haud crasso differt.

*Caules* ramosi, rugosi, cinerei, sparse pilosi, 3-5 mm. diametro 3 dm. infra apicem, novelli nigrescentes, striati, vix rugosi, versus apices pilis fulvis obtecti. *Folia* 6-8 cm. longa, pulvino conspicuo, rhachi sulcata sparse pilosa; pinnae 9-11-jugae, 5-7 mm. remotae, rhachillis minute pilosis; foliola circiter 30-juga, oblonga, apice obtusa, basi subauriculata, costa conspicua, 2·5-4 mm. longa, 0·5-1 mm. lata, glabra margine sparse ciliolato excepto. *Stipulae* lanceolato-acuminatae, 3 mm. longae. *Inflorescentia* satis elongata, circiter 1·4 dm. longa, sparse hirsuta. *Pedunculi* 2-3-fasciculati, 7-8 mm. longi; pedicelli 2·5-3 mm. longi. *Alabastra* obovoidea. *Calyx* cupularis, breviter 5-dentatus, vix 2 mm. longus, glaber, dentibus e basi lato triangulatis obtusis

circiter 0.5 mm. altis minutissime ciliolatis. *Petala* elliptico-ovata, obtusa vel subacuta, 6 mm. longa, 3 mm. lata, glabra. *Stamina* circiter 3 cm. longa, inferne in tubum 1.5 mm. longum coalita. *Annulus* 2 mm. altus, tenuis. *Ovarium* brevissime stipitatum, quadrangulatum, 8-ovulatum, 1.5 mm. longum, glabrum. *Legumen* 4-5-spermum, 7.5-8 cm. longum, 1 cm. latum, apiculo falcato terminatum, in basin gradatim angustatum, pilis patentibus obtectum, marginibus valde incrassatis.—*Calliandra grandiflora* Hemsl. Biol. i. 357, partim, non Benth.

CENTRAL AMERICA. Costa Rica: San José, Oersted 56 (type in Herb. Kew); by the river San Juan, Oersted 54.

1074. **Piriqueta (Erblichia) xylocarpa** *Sprague et Riley* [Turneraceae]; affinis *P. odoratae* (Seem.) Urb., a qua petiolis longioribus gracilibus, lamina pro rata angustiore in basin sensim attenuata apice acuta vel acuminata nec cuspidata, margine inconspicue tantum crenata, seminibus curvatis recedit.

*Rami* lignosi, teretes, glabri vel glabriusculi, fusco-cinerei, 7 mm. diametro circiter 3.5 dm. infra apices. *Folia* oblanceolata, 6.5-9.5 cm. longa, 2-3 cm. lata, apice acuta vel breviter acute acuminata, in basin sensim attenuata, tenuiter coriacea, concoloria, glabra, utrinsecus circiter 7-9-nervia, eglandulosa, inconspicue crenata; petioli graciles, 1-1.3 cm. longi, glabri, supra canaliculati; stipulae persistentes, late triangulares, vix 1 mm. longae, obtusae, superne subappresse fulvo-pilosae. *Flores* desunt. *Infructescentia* corymbosa; pedunculi sub fructu 1.6-2 cm. longi, glabriusculi; pedicelli solitarii, pedunculis crassiores, costati, basi vix ultra 2.5 mm. diametro, sursum gradatim incrassati, apice circiter 3.5 mm. diametro. *Capsula* ellipsoidea, lignosa, trivalvis, usque ad medium dehiscens, circiter 3.3 cm. longa, 1.5-1.7 cm. diametro, crebre subtiliter mammillata, juvenute minute puberula, demum glabra; valvae obtusae marginibus obliquis circiter 2 mm. latis. *Semina* obovoidea, leviter curvata, apice rotundato-subtruncata, 4-4.5 mm. longa, 2 mm. diametro, pallide straminea, longitudinaliter flexuose costata, hilo conico 0.5 mm. longo.

CENTRAL AMERICA. British Honduras, Campbell 33.

1075. **Strobilanthes circarensis** *Gamble* [Acanthaceae-Ruellieae]; *S. neilgherrensi* Bedd. affinis, ramulis minus strigosis, bracteis obovatis nec oblongis, calycis lobis angustioribus, magis sericeo-villosis, et foliorum nervis supra impressis differt.

*Frutex* erectus, ramulis subtetragonis ultimis exceptis glabris. *Folia* ovata, acuminata, basi acuta, haud decurrentia, crenulata, supra pilis basi albide bulbosis ornata, subtus praecipue ad nervos strigosa, ad paginam superiorem lineolata, ad 12 cm. longa. 6 cm. lata, nervis primariis utrinque 5-6 curvatis, supra impressis, transversis subparallelis; petiolus 2 cm. longus, sed in foliis floralibus saepe o. *Flores* in capitulis densissimis conferti ad apices ramulorum, foliis floralibus 4 cincti; bractee obovatae, acutae, foliaceae, ad basim densissime villosae, 2 cm. longae;

bracteolae lineares, strigoso-hispidae, 15 mm. longae. *Calyx* fere ad basim 5-partitus, lobis sericeis linearibus bracteolis aequilongis supra glandulosis, infra subscariosis. *Corolla* ignota. *Ovarium* apice pubescens. *Capsula* oblongo-obovata, 1 cm. longa, glabra. *Semina* orbicularia, glabra.

S. INDIA. Vizagapatam District in N. Circars, at Peddavalasa 700 m. alt., *Gamble* 21779, Jan. 1890; at Endrika and Vantala, 1500 m. alt., *A. W. Lushington*, May-June 1914.

1076. ***Strobilanthes Lawsoni*** *Gamble* [Acanthaceae-Ruellieae]; sectonis *Endopogon* species, *S. gossypino* T. Anders. affinis, lanitie appressa, spicis gracilibus interruptis et foliis longissime attenuatis differt.

*Frutex* erectus, circiter 2 m. altus, ramulis tetragonis, floriferis appresse fulvo-lanatis, fructiferis glanduloso-villosis. Folia ovata, longissime cuspidato-acuminata, basi acuta et paulo in petiolum decurrentia, supra glabra sed minute lineolata, subtus appresse fulvo- vel griseo-tomentosa, marginibus integris, nervis utrinque circiter 10 subparallelis, 12-16 cm. longa, 5-6 cm. lata; petiolus gracilis, 3-4 cm. longus. *Apicae* axillares vel laterales vel ramosum apices versus aggregatae, paniculatae, interruptae, floriferae appresse fulvo-tomentosae, fructiferae glanduloso-villosae, 6-10 cm. longae, flores ad nodos binos gerentes; bracteae ovatae acuminatae, intus glabrae, 5 mm. longae; bracteolae 2, lineares, minutae, calyce breviores. *Calyx* circiter 7 mm. longus ad mediam partem primum, deinde in sepalis 5 lanceolatis divisus, sepalis intus glabris, fructiferis eximie glandulosis. *Corolla* pallide caerulea, 2 cm. longa; tubus brevis cylindricus limbo longior ventricosus, extus villosus intus pilorum lineis 2 erectis barbatus; lobi erecti rotundati vix patentes. *Stamina* 2, inclusa, filamentis ad basim albo-villosis. *Ovarium* glabrum; stylus gracilis, glaber, ad apicem minutissime puberula. *Capsula* 1.5 cm. longa, clavate, seminibus 4, retinaculis duris. *Semina* discoidea, areolata, siccitate glabra, madida conspicue villosa.

S. INDIA. Sispara Ghát, Nilgiris at about 1600 m. alt. in thick rain forest undergrowth, *M. A. Lawson and J. S. Gamble*, No. 13387, Nov. 1883 (flower); *J. S. Gamble*, No. 14252, June 1884 (fruit); Tambracheri Ghat, Wynad, *C. A. Barber* 5686, Jan. 1903; among rocks, Hills of Travancore, *T. F. Bourdillon* 42. Cultivated in Sim's Park Gardens, Coonoor (*K. Rangachari*) also Agri. Hort. Gardens, Madras (*Bourne*).

1077. ***Strobilanthes urceolaris*** *Gamble* [Acanthaceae-Ruellieae]; *S. Wightiano* Nees affinis, corolla urceolata, staminibus per paria junctis, paribus longe separatis, interioribus minoribus, et foliis majoribus magis petiolatis differt.

*Frutex* erectus, ramulis inferioribus teretibus, ultimis plus minus tetragonis hirsutis, innovationibus rufo-hirsutis. Folia ovata, acuta, basi rotundata, crenata, siccitate nigra, rugosa, supra pilis basi bulbosis tecta et lineolata, subtus pilis albis munita, 6-8 cm. longa, 4 cm. lata, nervis primariis circiter 6-7



impressis, nervulis transversis etiam multis impressis; petiolus 2-3 cm. longus. *Flores* in capitulis densis brevibus sed fructiferis longioribus, foliis involucentibus 2 vel pluribus ad basim munitis; bracteae obovatae apice crenatae; bracteolae lineares, 1 cm. longae, ciliatae. *Calyx* fere ad basim divisus; lobis linearibus, apice obtusis, albo-pilosis, 1 cm. longis, fructiferis majoribus et glandulosis. *Corolla* basi cylindrica vix 2 mm. longa, supra urceolaris 1 cm. longa intus pilorum fasciculo excepto glabra et flavo-brunnea, lobis rotundatis brevibus pallide roseis, ciliatis, subaequalibus. *Stamina* 4 didynama (quinto sterili interdum addito) monadelphae, paribus divaricatis longe separatis. *Ovarium* glabrum. *Capsula* obovata, acuminata, 1 cm. longa. *Semina* 4, complanata, glabra.

S. INDIA. Pulney Hills, head of Bodenaikanur Ghât, *Beddome*; Nilgiri Hills, *Schmidt*, at about 2500 m. alt. May 1889; *Gamble* 20539, Ootacamund, Jan. 1920 (a small-leaved form); *Bourne* 6491.

1078. ***Andrographis Lawsoni* Gamble** [Acanthaceae-Justicieae]; species humilis, *A. lobelioidi* Wt. affinis; calycis lobis longioribus, antheris non albide-barbatis, foliis fere glabris differt.

*Suffrutex* humilis, basi lignosus, ramis multis ascendentibus, strigoso-hirsutis, alternis tetragonis. *Folia* ovata, obtusa vel obtuse acuta, basi rotundata, marginibus conspicue ciliatis reflexis exceptis glabra, 10-15 mm. longa, 7-10 mm. lata, nervis utrinque circiter tribus: petiolus minimus vix 2 mm. longus. *Flores* in racemis terminalibus foliosis, aliquando paniculatis, erectis, bracteae parvae lineares. *Calyx* fere ad basim 5-partitus, lobis linearibus, glanduloso-hispidis, ad 5 mm. longis. *Corolla* rosea, labii superioris lobis eximie purpureo-notatis; tubus vix ventricosus, extus glanduloso-hispidus 5 mm. longus. *Stamina* 2; filamenta superne glabra, inferae alata et hispida; antherae glabrae sine barba pilorum alborum. *Stylus* linearis. *Capsula* ignota.

S. INDIA. S. Canara Ghâts, *Beddome*; Nilgiris, Ootacamund to Avalanche and Sispara, up to 2500 m. alt., *Wight* K. D. 2246, October 1852; *Gamble* 13349, November 1883; *Lawson*, November 1890.

1079. ***Lepidagathis Barberi* Gamble** [Acanthaceae-Justicieae]; *L. pungenti* Nees affinis, foliis angustioribus, bracteis et calycis lobis breviter mucronatis in capitulam ovoideam appressis nec patentibus differt.

*Fruticulus* humilis ramosus, ramulis subangulatis albis, ultimis albo-villosis. *Folia* coriacea, sessilia, ovato-oblonga, spinoso-mucronata, margine ciliata, 10-15 mm. longa, 4 mm. lata, nervis utrinque 3-4 in spinam desinentibus. *Flores* in capitulis axillaribus multibracteatis congesti; capitulae ovoideae, circiter 1 cm. longae; bracteae et bracteolae lanceolatae spinoso-mucronatae albido-pilosae. *Calyx* 5-partitus, lobi exteriores 3, quorum 2 ad mediam partem juncti, tertius latior, interiores 2 angusti magis pilosi, omnes breviter mucronati. *Corollae* tubus

2 mm. longus, limbus subito expansus bilabiatus extus villosus. *Stamina* 4 didynama. *Capsula* 2-locularis conica, apice solida, seminibus 2.—*L. pungens*, Wight Ic. t. 456 non Nees.

S. INDIA. Mysore and Carnatic, *G. Thomson* 105; Koilpatti, Tinnevely, *C. A. Barber* 3427, July 18, 1901; plains of Madura District, *Beddome*.

1080. ***Chrysalidocarpus glaucescens* Waby** [Palmae-Arecaceae]; species ex affinitate *C. lutescentis* H. Wendl. a qua tota planta fructu excepto glaucescente, caudice basi incrassato fructuque viridi-lutescente differt.

Tota planta glaucescens. *Caudices* 1.5–1.8 dm. diametro, basi conicus usque ad 3 dm. diametro, annulis distantibus instructi. *Folia* semierecta, apice recurvata, 2.43–3.48 m. longa; costa subtus convexa, supra canaliculata; pinnae alternae, bifariae, semierectae, 6–9 dm. longae, 5 cm. latae, acuminatae, inter se 3.75 cm. distantes, apice fissae, basi constrictae, nervis marginalibus instructae. *Spadices* interfoliaceae, robusta, reclinata; rami expansi, 9 dm. longi; ramuli 1.75–2.25 dm. longi. *Flores masculi* albi, minuti, dense aggregati. *Sepala* rotundata, profunde concava, 1.5 mm. diam., valde imbricata, carinata, marginibus membranaceis. *Petala* ovalia, obtusa, striata, 3 mm. longa, 1.5 mm. lata. *Filamenta* subulata, quam petala longiora; antherae 2 mm. longae, obpyriformes. *Ovarii* rudimentum columnare, quam petala paullo brevius. *Flores feminei* non visi. *Fructus* ellipticus, viridi-lutescens, 1.56 cm. longa, 6.25 mm. diametro.

WEST INDIES. Trinidad; Port of Spain, Victoria Square (cult.), *Trinidad Botanic Garden Herbarium*, no. 9849, coll. *J. F. Waby*.

Mr. Waby notes that there are four plants of this species growing within a short distance of each other and that they can easily be distinguished from those of *C. lutescens* growing close by on account of their being glaucescent and having the rings on the stem more pronounced and wider apart. The largest plant has two stout stems with swollen bases forked just above the ground just like the forking of the Doum Palm (*Hyphaene*) and three stout stems with swollen confluent bases crowded together but not forked, as well as several other smaller stems. Neither of the other plants has a forked stem. The history of these plants has not been recorded.

XLI.—REVISION OF THE GENUS *DICOMA*.

F. C. WILSON.

The generic name *Dicoma* was first mentioned by Cassini in 1817<sup>1</sup> in his account of the tribe *Carlineae*, and the type species, *D. tomentosa*, was described by him in 1818<sup>2</sup>. He published a further description of the genus and species in 1819<sup>3</sup>.

Lessing, in his account of the *Compositae* of the Berlin Herbarium in 1830<sup>4</sup>, added five new species, and arranged them in three sections, founded on characters derived mainly from the pappus, as follows :—

Sect. I. *D. tomentosa*, *D. capensis*.

Sect. II. *D. radiata*.

Sect. III. *D. rehmanoides*, *D. diacanthoides*, *D. Burmannii*.

Two years later Lessing<sup>5</sup> raised these sections to subgeneric rank as follows :—I. *Leucophyton*. II. *Rhigiothamnus*. III. *Macleodium*.

De Candolle<sup>6</sup> in 1838 enumerated ten species, slightly rearranging the groups and splitting Lessing's *Leucophyton* into two parts, *Eudicoma* and *Steirocoma*, and he added a fifth, *Pterocoma*, which included *D. speciosa*.

In 1864–5 Harvey<sup>7</sup> gave descriptions of eleven species from South Africa, arranged more or less after De Candolle, whilst in 1877 Oliver and Hiern<sup>8</sup> recorded four species from Tropical Africa.

In the following revision I have found it convenient to divide the 34 species now known into three sections :—

I. *Dimorphae*.—Pappus dimorphous, the outer setae barbellate or very rarely those of the outer flowers uniform and plumose (*D. capensis*), the inner setae broader with more or less membranous margins.

II. *Barbellatae*.—Pappus not dimorphous, all the setae barbellate.

III. *Plumosae*.—Pappus not dimorphous, all the setae plumose.

The following Revision is compiled from an examination of the material in the herbaria of the Royal Botanic Gardens, Kew, and the Natural History Museum, South Kensington. I am also indebted to Archdeacon Rogers for placing the specimens from his herbarium at my disposal.

## KEY TO THE SPECIES.

## Section I. DIMORPHAE.

Pappus of all the flowers barbellate :

Leaves glabrescent or scabrid above, with

<sup>1</sup> Diet. Sci. Nat., 7 : 110; <sup>2</sup> Bull. Soc. Philom. 12; <sup>3</sup> Diet. Sci. Nat. 13 : 194; <sup>4</sup> Linnaea 5 : 276; <sup>5</sup> Synop. Composit. 109; <sup>6</sup> Prodrum 7 : 35; <sup>7</sup> Fl. Cap. 3 : 516; <sup>8</sup> Fl. Trop. Afr. 3 : 442.



a loose indumentum below; heads 4-5 cm. in diameter, thistle-like with very numerous (over 200) stiff narrow spine-like bracts; Angola - - - - -

1. *Wehwitschii*.

Leaves hairy on both surfaces, densely woolly or felted below; heads smaller and with much fewer bracts than the preceding:

Inner pappus much broader than the outer, especially toward the base:

Involucral bracts tomentose, with long, slender, spreading, spine-like tips longer than the pappus; leaves linear to spatulate; Trop. Africa to India - - - - -

2. *tomentosa*.

Involucral bracts glabrous with pointed tips; much wider in upper part than preceding, and longer than the pappus; leaves linear or linear-lanceolate; heads rather large (about 2 cm. in diameter); Angola - - -

3. *Antunesii*.

Involucral bracts shortly pointed and concave, not longer than the pappus; leaves spatulate; heads small; Tanganyika - - - - -

4. *banguelensis*.

Inner pappus not broader than the outer in the upper part, but broadly ovate in the lower third; inflorescence cymose, many-flowered; tips of outermost bracts generally somewhat reflexed, and lower two-thirds of bracts strongly marked by two purple-black lines on the outer surface; Angola - - -

5. *foliosa*.

Pappus of marginal flowers uniform and plumose; outer pappus of inner flowers dimorphic, barbellate in the lower part, shortly plumose in the upper part, inner pappus expanded towards the base, plumose above the middle; South Africa - - -

6. *capensis*.

## Section II. BARBELLATAE.

Involucral bracts with fine thread-like tips, widening gradually toward the base:

Leaves linear to linear-lanceolate:

Heads few, large, up to 4 cm. in diameter, and usually wider than long:

Involucral bracts lanate or glabrous, numerous (at least 100) and very stiff; Trop. and South Africa - - -

7. *anomala*.

Involucral bracts glabrous, few and yielding; Angola - - - - -

8. *elegans*.

- Involucral bracts very hairy; Belgian Congo - - - - - 9. *Ringoeti*.
- Heads numerous, not more than 2 cm. in diameter and, usually longer than wide. Involucral bracts few (about 50) and glabrous; Trop. and South Africa - - - - - 10. *Gerrardi*.
- Heads globose; leaves and flowers soon falling; peduncles persistent, giving a spiny appearance to the plant; Somali-land - - - - - 11. *somalensis*.
- Leaves ovate, spathulate, or suborbicular :  
 Outer involucral bracts recurved and yielding; leaves ovate or suborbicular :  
 Leaves sessile, ovate, woolly-lanate below, at length almost glabrous above; heads sessile in leaf axils and longer than broad; South Africa - - - - - 12. *macrocephala*.
- Leaves shortly petiolate, suborbicular, woolly-lanate on both surfaces; heads sessile in leaf axils, not longer than broad; Trop. and South Africa - - - - - 13. *Schinzii*.
- Leaves sessile, obovate, lanate on lower surface, glandular-punctate above; heads pedunculate; South Africa - - - - - 14. *Galpinii*.
- Outer involucral bracts not recurved, and resistant; leaves small and spathulate :  
 Involucral bracts glabrous; leaves glandular above; South Africa - - - - - 15. *picta*.
- Involucral bracts woolly; leaves tomentose on both surfaces; Angola - - - - - 16. *Nachtigalii*.
- Involucral bracts broadly ovate at the base; margins of the upper part inrolled, forming short, stiff, spreading spines :  
 Leaves ovate to suborbicular, shortly petiolate, conspicuously 1-nerved, tomentose below, at length almost glabrous on upper surface; South Africa - - - - - 17. *spinosa*.
- Leaves ovate, glabrous, rather fleshy and veinless; South Africa - - - - - 18. *ramosissima*.
- Leaves lanceolate, broad-based, sessile, tomentose on upper surface, glabrous below; South Africa - - - - - 19. *relhanioides*.
- Leaves linear, narrower at base, canous below; S.W. Africa - - - - - 20. *Dinteri*.
- Leaves inrolled, woolly-lanate, sessile; Socotra - - - - - 21. *cana*.

Involucral bracts ovate and concave, with short pungent points, margins not inrolled :

Leaves ovate-elliptic, shortly petiolate, lower surface tomentose; heads longer than broad; Madagascar - - - 22. *incana*.

Leaves linear-lanceolate, almost sessile; heads about as long as broad; Madagascar 23. *Cowani*.

### Section III. PLUMOSAE.

Leaves dimorphic; the lower few and ob-ovate, petiolate; the upper very numerous and densely imbricate, lanceolate with pungent points, resembling and gradually merging into the involucral bracts; heads large, solitary, terminal; South Africa - 24. *argyrophylla*.

Leaves not dimorphic; more or less sharply differentiated from the involucral bracts :

Leaves long attenuated to the base, and usually much broader in the upper part, mostly oblanceolate or obovate :

Plants 1 ft. or more in height :

Heads usually few; leaves linear to obovate-oblanceolate, with numerous spreading lateral nerves; Trop. Africa - - - - - 25. *sessiliflora*.

Heads solitary or up to three; leaves obovate with few ascending lateral nerves; South Africa - - - 26. *Zeyheri*.

Heads numerous in a panicle; leaves oblanceolate; South Africa - - 27. *thyrsiflora*.

Plants about two inches in height;

Trop. Africa - - - - - 28. *nana*.

Leaves quite sessile with broad, clasping bases, sometimes decurrent, mostly linear or linear-oblong :

Outermost involucral bracts reflexed; heads pedunculate; leaf-bases clasping :

Leaves acute, canous below, margins revolute; peduncles not bracteate; involucral bracts somewhat flat, often with markedly membranous margins; Trop. Africa - - - - - 29. *Kirkii*.

Leaves linear to sub-spathulate, canous below; margins minutely serrate; Somaliland - - - 30. *gnaphaloides*.

Leaves obtuse, thinly hairy below; peduncles bracteate; flower heads in a dense panicle; Belgian Congo - 31. *Poggei*.

Leaves acute, becoming glabrous on both surfaces, margins not revolute; peduncles bracteate; involucral bracts concave; Natal - - - 32. *speciosa*.



Outermost involucre bracts not reflexed; leaf bases forming a sheath around the stem; S. Trop. Africa:

Flower heads sessile or subsessile in the axils of the uppermost leaves; upper leaves linear-lanceolate; plants up to 30 cm. high - - - 33. *quinquenervia*.  
Flower heads terminating short lateral branches; upper leaves narrowly linear; plants about 1 m. high 34. *vaginata*.

1. **D. Welwitschii** O. Hoffm. in Engl. Bot. Jahrb. 15: 544 (1893); Hiern in Cat. Afr. Pl. Welw. 1: 613 (1898).

TROPICAL AFRICA. Angola: Pungo Andongo; in sandy open woods near Mopopo and Sansamanda, May 1857, *Welwitsch* 3609 (type)! Malange, *Gossweiler* 1211! Kaconda, *Gossweiler* 1798! Cubango River, *Gossweiler* 1867! 3863!

2. **D. tomentosa** Cass in Bull. Soc. Philom. 1818: 47; Less. Synop. Composit. 108 (1832); DC. Prodr. 7: 36 (1838); Oliv. & Hiern in Oliv. Fl. Trop. Afr. 3: 443 (1877); Hook. f. Fl. Brit. Ind. 3: 387 (1881) incl. synonyms; O. Hoffm. in Engl. Bot. Jahrb. 15: 543 (1883); Hiern in Cat. Afr. Pl. Welw. 1: 613 (1898).

TROPICAL AFRICA. Senegambia: Lamsaar, *Leprieur*! French Sudan: Sicoro, *Chevalier* 221a; Ivory Coast, *Poisson*! N. Nigeria, *Moiser* 179! 264! Borgu; rocks near the town of Wawa, *Barter* 1299! Kouka, in sandy places, Jan. 1854, *E. Vogel* 30! Katagum Dist.; in fields, *Dalziel* 171! Sokoto, *Lely* 111! Kafaretti, Oct., *Lely* 676! W. Cameroons, *Talbot*! Angola: In sandy mint beds about Maianga do Pova, Feb. 1858, *Welwitsch* 3622! On a sandy clay soil, in places flooded in the rainy season, about the Lagoas de Funda, Icolo E. Bengo and Zenza do Golungo, *Welwitsch* 3623! in rough sunny situations near Bumbo, June 1860, *Welwitsch* 3990! dry river beds near Mossamedes, *Gossweiler* 64! Loanda, *Gossweiler* 166! Rattray! Olukonda, 1886, *Schinz* 2009! Eastern Sudan: Kordofan, *Kotschy* 99! Pfund 271! Djika, *Pfund* 366! Arasch-Cool, *Schimper* 100! Sheikh Talha, *Brown* 816! Abyssinia: in the mountains near Dscheladscheranne, *Schimper* 724! without precise locality, *Schimper* 426! near Gageros, *Schimper* 2262! Bogos, *Hildebrandt* 423! Colonia Eritrea: Bocos, *Pappi* 4! Kenya Colony: Sau, *Kassner* 758! Ngamiland: Kwebe Hills, *Lugard* 216! Rhodesia: Boruma, Dec., *Menyhart* 518! Bulawayo and Victoria Falls, *Eyles* 136! Port. E. Africa: Kaimba Island, *Kirk*!

NATIVE NAME: Dowda (*Dalziel*).

SOUTH AFRICA. Transvaal: Komati Poort, *Schlechter* 11844! *Rogers* 19532! 19537! Messina Div.; Zoutpansberg, *Rogers* 20993! Pietersburg Div.; The Downs, *Rogers* 20227!

SOCOTRA. *Schweinfurth* 438! *Balfour* 228!

INDIA. Gangetic Plain : ravines near Etawah, *Duthie* 4718 ! N.W. India, *Royle* ! Dhaulpoor, *Jameson* ! Punjab : Hissar dist. ; Tusham, *Drummond* 25556 ! 25557 ! near Rewari, *Drummond* 15179 ! near Dadam, *Drummond* 15178 ! near Mount Dahlu, Narnaul, *Drummond* 15177 ! Scind, *Stocks* ! Bombay, *Herb. Lambert* ! *Dalzell* ! Gokak Falls, *Ritchie* 1803 ! Madras, *Shooter* ! *Herb. Wight* 1670 ! 1497 ! Nilghiri Hills, *Hook. f. & Thompson* : Mysore : Barbadun Hills, *Law* ! Coimbatore Dist. ; Bhavani, *Bourne* 5067 ! *Champion* ! *Herb. Wight* 1670 ! Courtallum, *Hook. f. & Thomson* !

3. **D. Antunesii** *O. Hoffm.* in Warb. Kunene-Sambesi Exped. 425 (1903).

TROPICAL AFRICA. Angola : Mundongo, *Baum* 926 ! near Mumpulla, very rare, *Welwitsch* 3608 !

4. **D. banguelensis** *Bus. et Musch.* in Engl. Bot. Jahrb. 49 : 514 (1913).

TROPICAL AFRICA. Tanganyika Territory : Mountain Plains between Usumbura and Bukoba, 1100 m., June 1910, *Helena von Aosta* 1211.

5. **D. foliosa** *O. Hoffm.* in Engl. Bot. Jahrb. 15 : 543 (1893) and in Bol. Soc. Brot. 10 : 184 (1893).

TROPICAL AFRICA. Angola : Mossamedes ; Garganta do Rio Bero, *Welwitsch* 3617 ! at base of Montes Negros, *Welwitsch* 3618 ! annual, or gradually turning woody and biennial with gnaphaloid habit, *Welwitsch* 3619 !

6. **D. capensis** *Less.* in Linnaea 5 : 277 (1830) ; *Less. Synop. Composit.* 109 (1832) ; *DC. Prodr.* 7 : 36 (1838) ; *Harv. in Fl. Cap.* 3 : 516 (1865).—*D. capensis* vars. *leiolepis* and *angustifolia* *DC. Prodr.* 7 : 36 (1838).

SOUTH AFRICA. S.W. Protectorate : near Ruman's Drift *Pearson* 4516 ! 4698 ! branches prostrate in sand, *Pearson*, 4045 ! in sand, Reitfontein, *Pearson* 3460 ! sandy slopes at Kamabies, *Pearson* 3779 ! on sandstone at Sandverhaat, *Pearson* 4684 ! High plateau north of Freistadt, *Pearson* 9393 ! Great Fish River Bed, *Pearson* 9277 ! Haikamchal, *Pearson* 7665 ! western Karasberg : stony slopes on granite plateau between Dassiefontein and Noachebel, *Pearson* 7916 ! Karroo : in desert, *Drège* ! Prince Albert Div. ; near Welteorede, *Drège* 1839 ! by the Sunday River, *Burchell* 2940 ! stony hill sides, Graaff Reinnet, *Bolus* 447 ! Middelburg Div., *Gilfallan* 2992 ! Bushman Land : on red sand near outspan, 8 miles S.W. or W. of Bitterfontein, *Pearson* 3312 ! Bechuanaland : Springbokhom, *Zeyher* 1030 ! Prieska Div. ; Modder Gat Poort, *Burchell* 1620 ! Herbert Div. ; Douglas, *Orpen* 1911 ! Orange Free State : on rocky hills where the soil is red, *Barker* 29 ! Kimberley ; grass veldt, *Wilman* ! Transvaal : Brack River, *Burke* ! Aapges River, *Burke* !

7. **D. anomala** *Sond.* in Linnaea 23 : 71 (1850) ; *Harv. in Fl. Cap.* 3 : 517 (1865) ; *Oliv. and Hiern in Fl. Trop. Afr.* 3 :

443 (1877); Hiern in Cat. Afr. Pl. Welw. 1: 613 (1898).—*D. anomala* var. *Sonderi* Harv. and var. *cirsiioides* Harv. in Fl. Cap. 3: 517 (1865); *D. cirsiioides* Harv. l.c. nomen. *D. karaguensis* Oliv. in Trans. Linn. Soc. 29: 103 (1873). *D. anomala* var. *karaguensis* Oliv. and Hiern in Fl. Trop. Afr. 3: 443 (1877). O. Hoffm. in Bol. Soc. Brot. 10: 185 (1893); Hiern in Cat. Afr. Pl. Welw. 3: 614 (1898). *D. nyikensis* Baker and *D. megacephala* Baker in Kew Bull. 1897 (271).

TROPICAL AFRICA. Angola: on rocky slopes of Alto Queta among short grass, *Welwitsch* 3614! on dry elevated declivities of the Central Queta, Carangue, *Welwitsch* 3613! in open gravelly pastures near Mumpulla, *Welwitsch* 3610! on the northern sunny slopes of the mountains of Alto Queta, *Welwitsch* 3607! in sandy thickets near the Monino, *Welwitsch* 3611! Malange, *Gossweiler* 1153! Massaca Kuelai, *Gossweiler* 3341! Kassuango, *Gossweiler* 3742! Tonga-Kuiriri, *Gossweiler* 4096! 4076! Munongue, *Gossweiler* 4143! Kuiriri, *Gossweiler* 4142! Micango, *Gossweiler* 3712! Kubango, *Gossweiler* 4179! Kuito, *Gossweiler* 3785! Benguella, *Wellmann*! Huilla; Humpata, *Johnston*! Kenya; Karagué, *Speke and Grant*! *Stuhlmann* 1672! Belgian Congo: near Mt. Masisi, *McClounie* 30! Mt. Lengo, *Kassner* 2979! Lapiku River, *Kassner* 2860! Kundelongu, *Kassner* 2798! Tanganyika region: Niamkolo, *Carson*! Kwebe *Baum* 804! 862! Ruwenzori; on dry hills, *Scott Elliot* 8144! Nyasaland, *Buchanan* 692! Nyika Plateau, *Whyte* 51! Shire Highlands, *Buchanan* 83! between Kondowe and Karonga, *Whyte* 512! Rhodesia: Livingstone; N. bank of Zambesi, *Rogers* 7497! in sandy soil, Livingstone, *Rogers* 7151! Mumbwa, *Macaulay* 347! 347B! Selukwe, *Walters* 2346! Bulawayo, *Rand* 486!

SOUTH AFRICA. Northern Kalahari Desert, near Inkonane Pito, *Lugard* 294! Transvaal: Waterburg Div.; Leeuwpoot, *Rogers* 21202! Lydenburg, *Rogers* 14568! Pilgrim's Rest, *Rogers* 14163! *Wilms* 657! Rustenburg, *Rogers* 22289! Pretoria, *Leendertz* 1096! Meintjes Kop, *Burt Davy* 3389! 5389! Irene, *Rogers* 23825! Rayton, *Rogers* 20467! Waterval Boven, *Mason* 121! Standerton, *Rogers* 18761! Boshoff, *Burt Davy* 14457! Johannesburg, *Rand* 1256! Potchefstroom; Welverdiend Stn., on sour veldt, *Burt Davy* H.14562! Lichtenburg, apparently local on stony red soil, *Burt Davy* 6! Wolmaransstad, *Rogers* 20619! Barberton; Kaapsche Hoep, *Rogers* 21269! Swaziland: Mbabane, *Rogers* 11469! Natal: Ingoma, *Gerrard* 1003! on the side of stony hills above the road leading up Oliver's Hoek Pass, *Wood* 3594! Greytown, *Wood* 881! Drakensberg, *Wood* 686! *Trannin* 2009! Mohlamba Range, *Sutherland*! East Griqualand: Kokstad, *Tyson* 1490! Basutoland: Leribe, *Dieterlen* 7149! 58! Doorn Key, *Burke*! Cala, *Pegler* 1715! Orange Free State: Bloemfontein, *Rehmann* 3826! Harrismith, *Sankey* 146! Vredefort, *Barrett-Hamilton*! on rocky hills,



*Baker*! Cape: Albert Dist., *Cooper* 1369! Maclear Div., banks of Klein Pot River, *Galpin* 6754!

8. **D. elegans** *Welwitsch* ex O. Hoffm. in Engl. Bot. Jahrb. 15 : 544 (1893).

TROPICAL AFRICA. Angola: open forests at Nene, *Welwitsch* 3621! Huilla, *Welwitsch* 3620! Chella mountains, *H. H. Johnston*! Mount Amaral, *Gossweiler* 1822!

9. **D. Ringoeti** *De Wild.* in Fedde Repert. 13 : 210 (1914).

TROPICAL AFRICA. Belgian Congo: Katanga; Shinsenda, *Homblé* 494.

10. **D. Gerrardi** *Harv.* in Fl. Cap. 3 : 517 nomen.—*D. anomala* var. *microcephala* *Harv.* in Fl. Cap. 3 : 517 (1865); *Oliver* and *Hiern* in Fl. Trop. Africa 3 : 443 (1877).

TROPICAL AFRICA. Salisbury, *Craster* 4! *Rand* 1445! *Hislop* 50! near Rhodes Dam, *Eyles* 1176! Victoria, *Munro* 883! Bulawayo, *Rogers* 13664!

SOUTH AFRICA. Cape: without locality, *Burke*! Prieska Division; Moddersfontein, *Conrath* 534! Transvaal: Zoutpansberg, *Burt Davy* 2857! Pietersburg, *Bolus* 11029! Makapansberge; Streydpoort, *Rehmann* 5444! Lydenburg, *Wilms* 658! *Rogers* 14566! South African Goldfields, *Baines*! Mountain sides, Saddleback Range, Barberton, *Galpin* 835! Rustenburg, *Nation* 158! Boshveld; between Elandsriver and Klippan, *Rehmann* 5075! Johannesburg, *Rand* 1260! Houtbosh, *Rehmann* 6142! Heidelberg, *Rogers* 13664! Orange Free State: Bloemfontein, *Rehmann* 3777! Zululand, *Gerrard* 1058! Natal: in dry places, *Sutherland*! Port Natal, *Gerrard* and *M'Ken* 1058! Ladysmith, *Wood* 5639!

11. **D. somalensis** *S. Moore* in Journ Bot. 1899 : 60.

TROPICAL AFRICA. Somaliland: Golis Range, *Drake-Brockman* 164! Bastireh, *Drake-Brockman*! near Obbia, *Drake-Brockman* 960! Wagga Mountains; Upper Sheik, *Lort Phillips*! *E. M. Godman* 75!

12. **D. macrocephala** *DC.* Prodr. 7 : 36 (1838); *Harv.* in Fl. Cap. 3 : 516 (1865).

SOUTH AFRICA. Klipplaat River, *Drège*! Bechuanaland: near the pass in the Krooman Hills, *Burchell* 2179! Pellar Plains, *Burchell* 2238! Vryburg, *Burt Davy* 13785! Orange Free State: Bloemfontein, *Odendaal*! Transvaal: Pietersburg, *Rogers* 897! Komati Poort, *Rogers* 20388! *Schlechter* 11786! Aapiess Poort, Pretoria, *Rehmann* 4056! Magalisburg, *Zeyher* 1029! Wolmaransstad, *Rogers* 20618!

13. **D. Schinzii** *Hoffm.* in Engl. Bot. Jahrb. 15 : 543 (1893).

TROPICAL AFRICA. Rhodesia: Victoria Falls, *Rogers* 5300! Sesheke District, *Gairdner* 218! Selukwe, *Walters* 2345! *Walters* 2347!

SOUTH AFRICA. Hereroland : Windhoek, *Dinter* 264 ! Bechuanaland : Northern Kalahari Desert ; Chukutsa Salt Pan, *Lugard* 222 ! Kwebe Hills, *Lugard* 163 ! Griqualand West : Hay Division ; Klip Fontein, *Burchell* 2168 ! Orange Free State : rocky hills, *M. E. Barter* ! *Nelson* 31 ! Transvaal : Waterberg ; Nylstroom, *Rogers* 24992 !

14. *Dicoma Galpinii* *F. C. Wilson* sp. nov. ; affinis *D. Schinzii* O. Hoffm., sed foliis sessilibus vel subsessilis, obovato-oblanco-latis supra crebre glanduloso-punctatis, capitulis pedunculatis differt.

*Herba* perennis usque ad 30 cm. alta ; caules erecti, graciles, angulati, superne leviter ramosi, laxe foliati, indumento lanato albido obtecti. *Folia* sessilia vel subsessilia, obovata vel oblanceolata, basi angustata, apice acuta, usque ad 5 cm. longa et 1.7 cm. lata, coriacea, minute serrulata, supra crebre glanduloso-punctata, epilosa, intra dense albido-lanata. *Capitula* solitaria, terminalia, pedunculata. Involucrum campanulatum, circiter 1.2 cm. longum ; bracteae pluriseriatae, lineari-lanceolatae, superne subfiliformes et recurvatae, pallide stramineae, glabrae. *Pappi setae* homomorphae, albae, 5 mm. longae, barbellatae. *Achaenia* angularia, ex parte inferiore pilis cinereo-albidis ascendentibus ornata.

SOUTH AFRICA. Transvaal : Pyramid Estate, near Potgietersrust Ravine, in granite mountains, 24th June, 1921, *Galpin* 9017 (type) !

15. *D. picta* *Druce* in Rep. Bot. Exch. Club Brit. Isl. 1916, 619. — *Leyssera picta* Thunb. Prodr. Pl. Cap. 160 (1800) ; Thunb. Fl. Cap. ed. Schultes 692 (1823). *Dicoma radiata* Less. in Linnaea 5 : 278 (1830) ; Less. Synop. Composit. 369 (1832). Harv. in Fl. Cap. 516 (1864-5).

SOUTH AFRICA. Cape : *Thunberg* (type), *Mundt and Maire* ; *Uitenhage*, *Echlon* and *Zeyher* ! *Alexander Prior* ! Karroo : Prince Albert Div., *Bolus* 11583 ! beyond Hartequas Kloof, *Massen* !

16. *D. Nachtigalii* O. Hoffm. in Engl. Bot. Jahrb. 15 : 545 (1893).

TROPICAL AFRICA. Angola : Mossamedes ; Tiger Bay, *Nachtigal* (type).

SOUTH AFRICA. S.W. African Protectorate : Angra Pequena, *Galpin and Pearson* 7642 !

17. *D. spinosa* *Druce* in Rep. Bot. Exch. Club Brit. Isl. 1914, 417. — *Xeranthemum spinosum* Linn. Sp. Pl. 2 : 1203 (1753) ; Thunb. Prodr. Pl. Cap. 153 (1800) ; Thunb. Fl. Cap. ed. Schult. 664 (1823). *D. Burmannii* and *D. diacanthoides* Less. in Linnaea 5 : 279 (1830) ; DC. Prodr. 7 : 37 (1838) ; Harv. in Fl. Cap. 3 : 517 (1865). *D. latifolia* DC. Prodr. 7 : 37 (1838).

SOUTH AFRICA. Cape : *Thoms* 376 ! Paarl Div. ; gravelly slopes near Paarl, *Tyson* 870 ! Worcester Div. ; Dutoits Kloof, *Drège* ! Caledon Div. ; Zwartberg, *Schlechter* 9794 ! Brededorp

Div.; *Schlechter* 9641! Swellendam; on dry hills near Brede River, *Burchell* 7467! near Buffeljagte River Drift, *Burchell* 7267! between Swellendam and Brede River, *Burchell* 7447! Riversdale; Zoetemeeks River, *Burchell* 6798! 6682! between Garcia's Pass and Krombeks River, *Burchell* 7166! George Div.; Keurbooms River, *Drège* 1039! Uniondale; Long Kloof, on a rocky hill near Haarlem, *Burchell* 5012! Uitenhage, *Zeyher*! hills at Gert's Kraal, *Alex. Prior*! Somerset, *Bowker*! between Comma-dagga and Zwartwater Poort, July 7, 1813, *Burchell* 335A! Graaff Reinet, *Bolus* 8564! without locality, *Masson*! *Niven*!

18. **D. ramosissima** *Klatt* in Bull. Herb. Boiss. 4: 843 (1896).

SOUTH AFRICA. Gt. Namaqualand: Keetmanshoop, *Fleck* 116; *Fenchel* 51.

I have not seen a specimen of this plant, but from description it comes very near *D. spinosa* Druce.

19. **D. relhanioides** *Less.* in Linnaea 5: 279 (1830); *Less. Syn. Composit.* 110 (1832); *DC. Prodr.* 7: 37 (1838).

SOUTH AFRICA. Karroo: Gamkas, *Mundt and Maire* (type).

20. **D. Dinteri** *S. Moore* in Bull. Herb. Boiss. Ser. ii. 4: 1024 (1904).

SOUTH AFRICA. Hereroland; Windhoek, 1904, *Dinter* 1025 (type).

21. **D. cana** *Balf. f.* Bot. Socotra, 143 (1888).

SOCOTRA: *Mr. & Mrs. Theodore Bent*! *Balfour* 157 (type)!

22. **D. incana** *O. Hoffm* in Engl. et Prantl, Naturl. Pflanzenfam. 4: 5: 339 (1893).—*Brachychaenium incanum* *Baker* in Journ. Linn. Soc. 25: 330 (1890).

MADAGASCAR. A tree; sterile places near Trabonji, *Hildebrandt* 3446 (type)! *Baron* 6797!

23. **D. Cowani** *S. Moore* in Journ. Bot. 44: 149 (1906).

MADAGASCAR. Ankafana, *Deans Cowan* (type)!

24. **D. argyrophylla** *Oliv.* in Hook. Icon. Pl. t. 15: 1461 (1884).

SOUTH AFRICA. Natal: *Gerrard* 1906 (type)! Farkkop, *Rehmann* 7656! grassy hills between Umlaas and Camperdown, *Wood* 359! 1825! Zululand: Farm Egoa, *Curson* 1643! Alexandra Dist; *Dumisa*, *Rudatis* 1344! East Griqualand: *Clydesdale*, *Tyson* 1192!

25. **D. sessiliflora** *Harv.* in Fl. Cap. 3: 518 (1865); *Oliv. & Hiern* in Fl. Trop. Africa 3: 444 (1877).—*D. membranacea* *S. Moore* in Bull. Herb. Boiss. Ser. ii. 4: 1025 (1904).

TROPICAL AFRICA. N. Nigeria: in cultivated ground at Abinsi, *Dalziel* 663! Lokoja; in spur of Mount Patti, *Dalziel* 33! by the roadside, *Parsons* 75! Borgu, *Barter* 717! Naraguta; on bare ground, *Lely* 701! Angola: Bailundo Dist; Benguella,



*Wellman*! Monongue, *Gossweiler* 4145! 2637! 3340! Sudan: Abu Gurun; Seriba, *Schweinfurth* 4282! Belgian Congo: Elisabethville, *Burt Davy* 18051! Musofi River, *Kassner* 2689! Mt. Mugila, *Kassner* 2991! Tanganyika Territory: Manganja Hills, *Meller* (type)! Nyasaland: Panda Peak, *McClounie* 19! Shiri Highlands, *Buchanan* 457! 149B! 989! 738! Zomba, *Sharpe* 162! near Lake Nyassa, *Johnston*! Lukoma, *Bellingham*! Port. E. Africa: Rovuma, *Kirk*! Ntondwe, *Cameron* 120! Rhodesia: Umtali, *Rogers* 4058! Broken Hill, *Rogers* 8115! Mumbwa, *Macaulay* 747!

NATIVE NAME: Alkamman kwadi (Dalziel).

26. **D. Zeyheri** *Sond.* in *Linnaea*, 23: 71 (1830); *Harv.* in *Fl. Cap.* 3: 518 (1865).

SOUTH AFRICA: Transvaal: Rustenburg, *Rogers* 1! in dry sandy soil, *Nation* 179! Magalisburg, *Burke & Zeyher* 1031 (type)! *Burke*! Pretoria; Gezina, *Mogg* 1002! *Burt Davy* 5377! Meintjes Kop, *Burt Davy* 3961! 5377! Arcadia, *Burt Davy* 3925! *Rehmann* 4785! Johannesburg; Turfontein, *Bryant* D90! *Rogers* 1358! Rand 1258! Burttholm, Vereeniging, *Burt Davy* 15258! Lydenburg, *Wilms* 661! 661a! Dwar River, *Nelson* 548! Barberton; Nelspruit, *Rogers* 20252! Ragton, *Rogers* 20450! Waterval Boven, *Rogers* 14098! *Mason* 8! Komati River, *Jenkins* 1303! Swaziland: *Stewart* 6! Mbabane, *Rogers* 11662! Zululand: *Wood* 739! Natal: *Gerrard* 1028! on grassy slopes, Hlaticula, *Stewart* 86! *Stainbank* 3644!

27. **D. thyrsiflora** *Thell.* in *Thell. & Schinz*, *Viert. Naturf. Gesell. Zur.* 66: 251 (1921).—*D. Zeyheri* *Sond.* var. *thyrsiflora* *Klatt.* in *Bull. Herb. Boiss.* 4: 844 (1896).

SOUTH AFRICA. Transvaal: Kaap river valley; Barberton, *Galpin* 911 (type)!

28. **D. nana** *Welw.* *Hiern* in *Cat. Afr. Pl. Welw.* 3: 614 (1898).—*D. plantaginifolia* *O. Hoffm.* in *Engl. Bot. Jahrb.* 15: 546 (1893).

TROPICAL AFRICA. Angola: Lopollo and Mumpulla, *Welwitsch* 3615 (type)! 3616! Thickets at N'Bango, Malange, *Gossweiler* 1207! Kubango, *Gossweiler* 4350!

*Hoffmann's* specimen of *D. plantaginifolia* described from a very imperfect example from Malange, Angola (*Teuscz* 180) is identical with *D. nana* *Welw.*

29. **D. Kirkii** *Harv.* in *Fl. Cap.* 3: 518 (1865); *Oliv. & Hiern* in *Fl. Trop. Afr.* 3: 444 (1877).—*D. Kirkii* var. *microcephala* *S. Moore* in *Journ. Bot.* 1921: 231.

TROPICAL AFRICA. Tanganyika Plateau: Fort Hill, *Whyte*! Nyasaland: Shire Highlands, *Adamson* 79! Kondowe, *Whyte*! Rhodesia: Highlands of Batoka Country, *Kirk* (type)! Chirinda, *Swynnerton* 444! Umtali: Manica; Odzani River Valley, *Teague* 154! Salisbury, *Craster* 3! Rand 1444! Mazoe, *Eyles* 186! Victoria, *Munro* 413! 1120B! 1982! 1100C!

SOUTH AFRICA. Transvaal: Barberton, *Thorncroft* 1074!

30. *D. gnaphaloides* *Matt.* in *Boll. Ort. Bot. Palermo* vii : 112 (1908).

TROPICAL AFRICA. Somaliland : Torda ; Goscia, abundant about the plains and dunes, *Macaluso* (type).

NATIVE NAME : Bisciar.

I have not seen a specimen of this species, but from description it seems to come very near *D. Kirkii*.

31. *D. Poggei* *O. Hoffm.* in *Engl. Bot. Jahrb.* 15 : 546 (1893).

TROPICAL AFRICA. Belgian Congo : Lunda, 8.5° S., Dec. 1875, *Pogge* 254.

I have not seen a specimen of this species, but from description it apparently comes near to *D. Kirkii* and is distinguished from that species as shown in the key.

32. *D. speciosa* *DC.* *Prodr.* 7 : 37 (1838); *Harv.* in *Fl. Cap.* 3 : 518 (1865).

SOUTH AFRICA. Natal : *Gerrard* 443! between Omsanculo and Oncomas, *Drège* (type)! between Umzinikulu River and Umkomanzi River, *Drège* 1839! Field's Hill, *Wood* 3160! Ichanga, *Wood* 13007! *Cooper* 2567!

33. *D. quinquenervia* *Baker* in *Kew Bull.* 1895 (290).—*D. superba* *S. Moore* in *Journ. Linn. Soc. Bot.* 37 : 336 (1906).

TROPICAL AFRICA. Angola : Bailundo District; Benguella, *Wellman*! rather rare in young forests towards Catombe, *Gossweiler* 1216! Kakanda, *Gossweiler* 1752! Tanganyika Territory : hills near Chomo River, Mwera, *Carson* 4 (type)! Mount Kundelunja, *Kassner* 2727! Rhodesia : Chibanga, *Rogers* 8528! Mumbwa, *Macaulay* 803!

34. *D. vaginata* *O. Hoffm.* in *Engl. Bot. Jahrb.* 30 : 442 (1902).

TROPICAL AFRICA. Tanganyika Territory : Kinkagebirge; above Ikombe, on dry stony slopes, about 1200 m., fl. Sept. 1899, *Goetze* 1178 (type).

Native Name : Litoni.

I have not seen a specimen of this plant.

## XLII.—CONTRIBUTIONS TO THE FLORA OF SINALOA: IV.\*

L. A. M. RILEY.

LEGUMINOSAE, subfamily CAESALPINIOIDEAE.

*Caesalpinia bonducella* (*L.*) *Fleming*; *Mart. Fl. Bras.* xv. pars 2, 65, t. 21; *Fawcett and Rendle, Fl. Jam.* iv. part 2, 93, fig. 32.—*Guilandina bonducella* *L. Sp. Pl. ed. 2*, 545. *Caesalpinia Crista* *L. Sp. Pl. ed. 1*, 380, partim; *CNH*; xxiii. 422.

Along beaches on both coasts of Mexico (*Standley*).

---

\* Continued from *K.B.* 1923, p. 346.

**C. cacalaco** *H. et B. Pl. Équinox. ii. 173, t. 137*; Fernald in *Bot. Gaz. xx. 534*; CNH. xxiii. 423.

Ocean Beach, near Mazatlan, *Lamb* 363; without locality, *Gonzalez* 671.

Vernacular name "Huisache".

Fernald (l.c.) says that *Lamb*'s specimen has stout recurved spines scattered along the rhachis of one of the leaves, the remaining leaves being unarmed. *Lamb*'s number 363 is represented by a sheet at Kew, but I can discover no trace of spines on any leaf rhachis. On the other hand, *Jurgensen*'s number 619 from Mexico (Sierra San Pedro Nolasco, Talea, etc.), of which there are two sheets at Kew, has one leaf with prominently spiny stipels, the other leaves showing no trace of spines. *Humboldt* and *Bonpland* (l.c.) describe the leaves as being unarmed.

**C. coriaria** (*Jacq.*) *Willd.*; CNH. xxiii. 422.—*Poinciana coriaria* *Jacq. Stirp. Amer. 123, t. 175, fig. 36.*

Sinaloa (fide *Standley*).

**C. eriostachys** *Benth.*; CNH. xxiii. 424.

San Ignacio; Cerro Prieto, 280 m., *Gonzalez* 117.

Vernacular name "Iguano".

**C. mexicana** *A. Gray* in *PAA. v. 157* (1862); CNH. xxiii. 426.

Mazatlan, *Lamb* 341.

*Lamb*'s specimen was determined at the Gray Herbarium as *C. mexicana* var. *pubescens* *Robins. et Greenm. (PAA. xxix. 386; 1894).* It agrees with the description of that variety in having the leaflets softly pubescent, but the petals are not ciliate with stipitate glands. *Standley* says that the species is variable.

**C. Ortégae** *Standley* in *Journ. Wash. Acad. Sc. xiii. 6* (1923).

Choix; La Peonia, 600 m., *Gonzalez* 890.

Vernacular name "Tabachín simarrón."

Well distinguished from the related Mexican species by the extraordinary abundance of stipitate glands on all parts of the plant (*Standley*).

**C. Palmeri** *S. Wats.* in *PAA. xxiv. 47* (1889); CNH. xxiii. 426.

Sinaloa (fide *Standley*).

**C. platyloba** *S. Wats.* l.c. xxi. 425 (1886); CNH. xxiii. 423.

San Ignacio; Arroyo de Campanillas, 360 m., *Gonzalez* 601.

Vernacular names "Palo colorado", "Arellano".

*Gonzalez*' specimen consists only of flowers and young leaves, whereas the Kew material, with which I have compared it, shows only fruit and mature leaves. Sinaloa is included in the distribution of *C. platyloba* by *Standley*.

**C. pulcherrima** (*L.*) *Swartz*; *Fawcett and Rendle, Fl. Jam. iv. part 2, 95*; CNH. xxiii. 424.—*Poinciana pulcherrima* *L.*; *SBH. 281*; *Britton and Millsp. Bahama Fl. 174.*

Cultivated in the gardens of Mazatlan and San Sebastian, and in some parts run wild (*Seemann*). San Ignacio; Colompo, 250 m., *Gonzalez* 426.



Vernacular names, "Tabachil", "Tabachín", "Tabachino", "Tabaquín".

**C. sclerocarpa** Standley in CNH. xx. 214 (1919); CNH. xxiii. 423.

Between Rosario and Acaponeta, *Rose* 1870; Guadalupe, *Rose*, *Standley and Russell* 14748; near Colomas, *Rose* 3241.

Vernacular name "Ebano".

**Haematoxylon brasiletto** Karst. Fl. Columb. ii. 27, t. 114; CNH. xxiii. 419.—*H. boreale* S. Wats.; *Zoe*, v. 201. *H. campecheanum* Seem. Bot. Herald, 281 (1856), non L.

Common between Mazatlan and San Sebastian (Seemann). Culiacan, *Brandeggee*. San Ignacio; El Limon, 210 m., *Gonzalez* 128.

Vernacular name "Brasil".

Standley reduces the Mexican *H. boreale* to the Colombian *H. brasiletto*. On the whole the Mexican specimens seem to have more anfractuose, more spiny and paler branchlets, and relatively broader fruits.

**Delonix regia** (Boj.) Raf.; CNH. xxiii. 427.—*Poinciana regia* Boj.; Bot. Mag. t. 2884.

San Ignacio; Hacienda de la Cana, 380 m., *Gonzalez* 850. Widely cultivated in Mexico as a shade tree and sometimes growing without cultivation (Standley).

Vernacular names, "Tabachín", "Tabuchín".

The genera *Poinciana* L. (1753) and *Poincia* Neck. (1790) were based on *P. pulcherrima* L. The genus typified by *P. regia* Boj. should bear the name *Delonix*, as has been recognized by Merrill (Philipp. Journ. Sc., Bot. v. 52) and Gamble (Fl. Madras, 396).

**Conzattia sericea** Standley in CNH. xxiii. 428 (1922).

Culiacan: Ymala; Rio de Tamazula, 80 m., *Gonzalez* 4169 (ex Standley).

Vernacular name "Navío".

**Parkinsonia aculeata** L.; *Zoe*, v. 201; CNH. xxiii. 428.

Culiacan, *Brandeggee*. San Ignacio; Laguna Seca, 40 m., *Gonzalez* 201.

Vernacular name "Retama".

**Cassia atomaria** L.; Benth. in Trans. Linn. Soc. xxvii. 548; CNH. xxiii. 410.

Sinaloa (fide Standley).

**C. biflora** L.; Benth. l.c. 543; CNH. xxiii. 409.

San Ignacio; Cerro del Aguajito, 520 m., *Gonzalez* 576.

Vernacular names "Vara prieta", "Biche silvestre".

**C. emarginata** L.; Benth. l. c. 548; CNH. xxiii. 410.

San Ignacio; Piedras de Lumbre, 50 m., *Gonzalez* 146.

Vernacular name "Mora hedionda".

In Sinaloa the leaves are applied to allay the pain of insect stings (Standley).

**C. laevigata** Willd.; Benth. l. c. 527; CNH. xxiii. 407.

Sinaloa (fide Standley).

**C. leptadenia** var. **jalisensis** Greenm. in PAA. xli. 239 (1905).—

*C. Chamaecrista* Hemsl. Biol. i. 329 (1880) partim, non L.

Cerro de Pinal, fr. Dec. 1848, *Seemann* 1528. San Ignacio; Las Trompetas, 600 m., *Gonzalez* 507.

The Sinaloa specimens differ from typical *C. leptadenia* var. *jalisensis* in the stouter, more shortly stipitate petiolar glands, and the somewhat larger flowers.

**C. leptocarpa** Benth. in Linnaea xx. 528 (1849); et in Trans. Linn. Soc. xxvii. 531; CNH. xxiii. 404.

Sinaloa (fide Standley).

Vernacular name "Viche".

**C. occidentalis** L.; Benth. in Trans. Linn. Soc. xxvii. 532; CNH. xxiii. 404.

Sinaloa (fide Standley).

**C. oxyphylla** Kunth, Mimos. 129, t. 39 (1823); Benth. l.c. 521, t. 61; CNH. xxiii. 406.

Sinaloa (fide Standley).

Vernacular name "Casia fistula".

Plant used in Sinaloa as an emetic.

**C. pauciflora** H.B.K. Nov. Gen. vi. 360 (1823); SBH. 281; Benth. l.c. 559; Hemsl. Biol. i. 333; CNH. xxiii. 403.—*C. punctulata* Hook. et Arn. Bot. Beech. 420 (1841).

Cerro de Pinal, fl. and fr. Dec. 1848, *Seemann* 1537. San Ignacio: Cerro del Aguajito; Campanillas, 66 m., *Gonzalez* 579.

Vernacular name "Bejuco".

*C. pauciflora* was collected by Humboldt and Bonpland at La Venta del Peregrino, 1080 ft., in Guerrero, about 30 miles (52 miles by road) north-north-east of Acapulco. The leaflets are described as 4-5 lines long, viscous and glabrous, and obtuse. The species accepted by *Seemann*, *Bentham*, and others as *C. pauciflora* H.B.K. differs from *Kunth's* description in several respects. The leaflets are not glabrous, are often more than 4-5 lines long, and possess a distinct mucro, which latter is not mentioned by *Kunth*. The racemes, also, can hardly be described as few-flowered. Its distribution is from Sinaloa to Nicaragua. As there is no other species known from the neighbourhood of Acapulco which can be referred to *C. pauciflora*, it seems possible that the identification may be correct, and it is therefore desirable to retain the name for the present.

**C. rotundifolia** Pers., var. **bauhiniifolia** (*Kunth*) Benth. l.c. 570; Mart. Fl. Bras. xv. pars 2, 162; Hemsl. Biol. i. 334.—*C. rotundifolia* var. *fabaginifolia* Benth. ex Seem. Bot. Herald, 281. *C. bauhiniifolia* *Kunth*, Mimos. 123, t. 37 (1823). *C. fabaginifolia* H.B.K. Nov. Gen. vi. 363 (1824).

Cerro de Pinal, fr. Dec. 1848, *Seemann* 1536. San Ignacio; San Agustin, 200 m., *Gonzalez* 622.

**C. Tora** *L.*; Benth. l.c. 535; CNH. xxiii. 405.

Sinaloa (fide Standley).

Vernacular name "Biche manso".

**Bauhinia chlorantha** *Brandegee* in *Zoe*, v. 200 (1905).—*B. longiflora* Rose in CNH. x. 97 (1906); Standley in CNH. xxiii. 415.

Culiacan, *Brandegee*; Ymala, *Palmer* 1426.

Standley (l.c.) unites *B. chlorantha* and *B. longiflora*, and for some unexplained reason adopts the later name.

**B. latifolia** *Cav.* Ic. Pl. v. 4, t. 405 (1799); CNH. xxiii. 418.

San Ignacio; Arroyo de Palmarito, 230 m., *Gonzalez* 617.

Vernacular names "Pata de cabra", "Pié de cabra", "Guacimilla cimarrona".

**Tamarindus indica** *L.*; Rose in CNH. v. 225; Kew Bull. Add. Ser. ix. 275; Popenoe, *Man. Trop. Fruits*, 432, t. 56.

Grown all over tropical Mexico (Rose, l.c.).

[**Hymenaea Courbaril** *L.*; CNH. viii. 164, t. 41; CNH. xxiii. 413.—

*H. Candolleana* H.B.K. Nov. Gen. vi. 323, t. 566.

Tepic; Acaponeta; Falda del Cerro Cuatepec, 40 m., *Gonzalez* 1122.

Vernacular name "Guapinole".

Probably occurs in Sinaloa, but I have seen no specimens from that state.]

#### LEGUMINOSAE, subfamily MIMOSOIDEAE.

**Entada polystachya** (*L.*) *DC.* Mém. Légum. xii. 434, tt. 61, 62; Benth. in *Trans. Linn. Soc.* xxx. 364; CNH. xxiii. 349.—*Mimosa polystachya* *L.*; Jacq. *Sel. Stirp.* 265, t. 183, fig. 93.

Sinaloa (fide Standley).

**Piptadenia constricta** (*Mich. et Rose*) *Macbride*; CNH. xxiii. 354.—*Goldmania constricta* *Mich. et Rose* in *Mém. Soc. Phys. Nat. Hist. Genève*, xxxiv. 274, t. 20 (1903).

Mazatlan, Observation Hill, *Rose* 3107.

**Goldmania foetida** (*Jacq.*) *Standley*; CNH. xxiii. 354.—*Mimosa foetida* *Jacq.* Hort. Schoenbr. iii. 73, t. 390. *Piptadenia foetida* Benth. l.c. 366. *Goldmania platycarpa* *Rose* apud *Micheli*, l.c.

Culiacan, *Goldman* 371.

Vernacular name "Cusa".

**Prosopis juliflora** (*Swartz*) *DC.*; Benth. l.c. 377; CNH. xxiii. 351.—*Mimosa juliflora* *Swartz*.

Cosalá; Conitaca, 150 m., *Gonzalez* 811.

Vernacular name "Mezquite".

**Neptunia plena** (*L.*) *Benth.* in *Hook. Journ. Bot.* 1842, iv. 355; CNH. xxiii. 354.—*Mimosa plena* *L.*

Sinaloa (fide Standley).

**Mimosa affinis** *Robinson* in *Bot. Gaz.* xvi. 341 (1891); PAA. xxxiii. 312.

Grassy land near Mazatlan, *Wright* 1218, 1265; without locality, *Gonzalez* 229.

Vernacular names "Sensitiva", "Diente de Culebra".

**M. albida** *H. et B.*; Benth. in Trans. Linn. Soc. xxx. 390; Robinson in PAA. xxxiii. 310; CNH. xxiii. 360.

Sinaloa, *Rose* 1731.

A peculiar form with broad very obtuse leaflets (Robinson l.c.).

**M. coelocarpa** *Robinson* in PAA. xxxiii. 319 (1898); CNH. xxiii. 360.

Topolobampo, *Palmer* 187.

**M. distachya** *Cav.*; Benth. l.c. 417; PAA. xxxiii. 316; *Zoe*, v. 199; CNH. xxiii. 359.

Mazatlan, *Rose* 1393; near Altata, *Brandege*.

**M. eurycarpa** *Robinson* in PAA. xxxiii. 322 (1898); CNH. xxiii. 363.—*M. eurycarpoides* *Robinson* in PAA. xxxvi. 472 (1901).

Foothills of Sierra Madre, near Colomas, *Rose* 1805; between Acaponeta and Rosario, *Rose* 3157.

"It is possible that *M. eurycarpoides* is distinct, but it is known only from flowering branches, which show no essential differences from *M. eurycarpa*. The fruit originally described as belonging to *M. eurycarpoides* is probably that of *Acacia Farnesiana*" (Standley).

**M. Grahami** *A. Gray*; SBH. 282; Benth. l.c. 428; Hemsl. Biol. i. 348.

Sierra Madre, *Seemann* 2196.

**M. guatemalensis** (*Hook. et Arn.*) *Benth.*; Benth. l.c. 414; Hemsl. Biol. i. 348; PAA. xxxiii. 315; CNH. xxiii. 359.—*Inga guatemalensis* *Hook. et Arn.*

Cerro de Pinal, fl. Dec. 1848, *Seemann* 1538; near Colomas, *Rose* 3200.

**M. invis**a *Mart.*; *Mart.* Fl. Bras. xv. pars 2, 379, t. 97; Benth. l.c. 436; Robinson in PAA. xxxiii. 329; CNH. xxiii. 363.—*M. Ervendbergii* *A. Gray*, partim.

Mazatlan, *Lamb* 329.

Robinson (l.c.) refers to Lamb's specimen (distributed as *M. Ervendbergii*) as a noteworthy form with straighter spines and longer, less pubescent, unarmed peduncles.

**M. manzanilloana** *Rose* in CNH. i. 326 (1895); PAA. xxxiii. 309; CNH. xxiii. 361.

Sinaloa (fide Standley).

**M. Palmeri** *Rose*, l.c. 99 (1891); PAA. xxxiii. 318; *Zoe*, v. 199; CNH. xxiii. 360.

Common about Cofradia, *Brandege*. San Ignacio; El Aguajito, *Gonzalez* 442.

Vernacular name "Cuilón".

**M. pigra** *L.*; CNH. xxiii. 362.—*M. asperata* *L.*; Benth. l.c. 437. *M. asperata* var. *Berlandieri* *Robinson* in PAA. xxxiii. 331; *Zoe*, v. 199. *M. Berlandieri* *A. Gray*.

Sinaloa, *Lamb* 511; without locality, *Brandege*.

Robinson (l.c.) considers Lamb's specimen intermediate between typical *M. asperata* and the variety *Berlandieri*.



**M. polyantha** *Benth.* in Hook. Journ. Bot. 1842, iv. 410; PAA. xxxiii. 317; Zoe, v. 199; CNH. xxiii. 359.

Abundant about Culiacan, *Brandeggee*.

Vernacular name "Arrendador".

According to Brandeggee the variety *levior* Robinson, which has glabrous fruits, is also abundant in the same locality.

**M. purpurascens** *Robinson* in PAA. xxxiii. 317 (1898); CNH. xxiii. 359.

Sinaloa (fide Standley).

Vernacular names "Cuca", "Cuilón", "Iguano".

In Sinaloa the bark is used for tanning skins and it is sometimes chewed to harden the gums (Standley).

**M. spirocarpa** *Rose* in CNH. iii. 316, t. 11 (1895); PAA. xxxiii. 315; Zoe, v. 199; CNH. xxiii. 358.

Culiacan, *Palmer* 1476 H., *Brandeggee*; between Rosario and Colomas, *Rose* 1606.

**Leucaena lanceolata** *S. Wats.* in PAA. xxi. 427 (1886); CNH. xxiii. 368.

Sinaloa (fide Standley).

**L. microcarpa** *Rose* in CNH. v. 141 (1897); CNH. xxiii. 368.

Sinaloa (fide Standley).

According to Rose (CNH. v. 229), at Colomas the country people use the bark of a species of *Leucaena* called "Tepahuaje" to harden their gums. Standley (CNH. xxiii. 369) gives "Tepeguaje" as a vernacular name of *L. pulverulenta* (Schlecht.) Benth. but this species does not apparently occur on the Pacific slope. The names "Tepeguaje" and "Tepehuaje" are also used for species of *Lysiloma*.

**Acacia angustissima** (*Mill.*) *Kuntze*; CNH. xxiii. 381.—*Mimosa angustissima* *Mill.* *Acacia insignis* *Mart. et Gal.* in Bull. Acad. Brux. x. pars 2, 315 (1843). *A. ficina* *Benth.* in Trans. Linn. Soc. xxx. 532, partim.

San Ignacio; Lagunillas, 380 m., *Gonzalez* 492.

Vernacular name "Guajillo" (Standley).

*Gonzalez*' specimen agrees with *Galeotti* 3303 (*A. insignis*) which has slightly larger capitula than *Miller's* type.

**A. crinita** *Brandeggee* in Zoe, v. 198 (1905); CNH. xxiii. 380.

Cerro Colorado, *Brandeggee*.

**Acacia cymbispina** *Sprague et Riley*, nom. nov.; affinis *A. cochliacanthae* *Humb. et Bonpl.*, quacum hucusque confusa, pinnis foliolisque pluribus, floribus luteis, lobis corollae brevibus latis pilosis differt.

*Caules* annotini lignosi, tortuosi vel subanfractuosi, sparse cinereo-puberuli, 3 dm. infra apicem 3 mm. diametro, hornotini densius cinereo-puberuli; spinae ramulorum fertilium subulatae, 3-5 mm. longae, basi usque ad dimidium longitudinem puberulae, ramulorum sterilium cymbiformes, acutissimae, 4-4.5 cm.

longae, cinereae, papillis minutis obtectae. *Folia* 3·5–10 cm. longa, petiolo 0·9–1·3 cm. longo cinereo-puberulo glandulam unicam crassam versus apicem gerente, rhachi ut petiolo minute pubescente eglandulosa glandula inter par pinnarum terminale excepta; pinnae 6–18-jugae, jugis circiter 4 mm. remotis; foliola 16–28-juga, oblongo-linearia, obtusa, basi subauriculata, 1·5–2 mm. longa, 0·5 mm. lata, supra glabra, subtus minute papillata, marginibus sparsissime ciliolatis, costa conspicua fere mediana. *Capitula* axillaria, gemina, 6–7 mm. diametro staminibus inclusis, circiter 35-flora, pedunculis 1·4–2 cm. longis cinereo-puberulis. *Flores* sessiles, lutei. *Calyx* campanulatus, 1·25 mm. longus, puberulus, fere truncatus vel lobis leviter sinuatis, dimidium corollae aequans. *Corolla* 2·5 mm. longa, minute puberula, 4-lobata, lobis deltoideis obtusiusculis, sinibus inter lobos vix 0·5 mm. longis. *Stamina* corollam circiter 1 mm. superantia. *Stylus* 1·75 mm. longus. *Ovarium* stipitatum, 1·5 mm. longum, 14-ovulatum, prima visu glabrum, versus apicem inconspicue et sparse appressi-pilosum. *Legumen* compressum, stipitatum, falcatum, coriaceum, apice angustato-obtusum, circiter 4·5 cm. longum, 8–9 mm. latum, glabrum, pilis paucis minimis exceptis.—*Mimosa campeacheana* Mill. Gard. Dict. ed. 8, *Mimosa* no. 20 (1768). *Acacia cochliacantha* S. Wats. in PAA. xxi. 427 (1886) et xxiv. 49 (1889); Safford in Journ. Wash. Acad. Sc. v. 360 (1915) in obs.; Standley in CNH. xxiii. 373 (1922); non Humb. et Bonpl.

Sonora: Guaymas, *Palmer* 101, Bazadehuachi, *Hartman* 251. Chihuahua: Hacienda San Miguel, *Palmer* 71. Sinaloa (fide Safford l.c.). Jalisco: Barranca near Tequila, *Pringle* 4428 (thornless form). Colima: *Palmer* 1353. Vera Cruz, *Houston*.

A specimen from Acapulco (Guerrero), *Palmer* 305, probably belongs here, but the fruits are only slightly compressed, and are abruptly rounded at the apex with a small apiculus instead of being gradually narrowed.

Houston's specimens (the type of *Mimosa campeacheana*) are without flower or fruit, but agree with the other material above cited in the spines and leaves. The description of *A. cymbispina* has been drawn up mainly from *Palmer's* no. 101.

The new name *Acacia cymbispina* is required as the name *A. campeacheana* has been used for another species by Schenck (*Fedde*, Repert. xii. 361, 1913; *Engl. Jahrb.* l. Suppl. 465, 1914).

**A. Farnesiana** (L.) Willd.; SBH. 282; Benth. in Trans. Linn. Soc. xxx. 502; Hemsl. Biol. i. 352; CNH. xxiii. 378.—*Mimosa Farnesiana* L.

Sierra Madre, common throughout the region, covering large districts of the tableland of Durango, *Seemann* 2197. San Ignacio: R. de los de Ponce, 260 m., *Gonzalez* 131.

Vernacular names "Binorama", "Vinorama", "Visacha".

**A. gladiata** *Safford* in Journ. Wash. Acad. Sc. v. 359, fig. 2 (1915); CNH. xxiii. 374.

Rosario, *Gregg* 1135.

**A. Hindsii** *Benth.* in Hook. Lond. Journ. Bot. 1842, i. 504; Safford in Journ. Wash. Acad. Sc. iv. 365; Standley in CNH. xxiii. 375, excl. syn. *A. sinaloensis* Safford.

Near Colomas, *Rose* 1766.

**A. lutea** (*Mill.*) *Hitchc.*—*Mimosa lutea* *Mill.* *A. macracantha* *Benth.* in Trans. Linn. Soc. xxx. 500, partim; Standley in CNH. xxiii. 374; non Humb. et Bonpl.

Sinaloa (fide Standley).

*Acacia lutea* cannot be conspecific with *A. macracantha*, which is described and figured (*H.* et *B.* Pl. Légum. 95, t. 28) as having the corolla three times as long as the calyx. I have seen no specimens from Mexico. *Acacia lutea* Leavenworth being a synonym of *Neptunia lutea* *Benth.*, the combination *Acacia lutea* (*Mill.*) *Hitchc.* is valid under International Rules.

**A. millefolia** *S. Wats.* in PAA. xxi. 427 (1886); CNH. xxiii. 377.

Sinaloa (fide Standley).

**A. occidentalis** *Rose* in CNH. viii. 32 (1903); CNH. xxiii. 382.

Sinaloa (fide Standley).

**A. pennatula** (*Schlecht. et Cham.*) *Benth.*; *Benth.* in Trans. Linn. Soc. xxx. 499; CNH. xxiii. 379.—*Inga pennatula* *Schlecht. et Cham.*

San Ignacio: San Juan, 300 m., *Gonzalez* 361.

Vernacular name "Espino".

**A. riparia** *H. B. K.*; *Benth.* l.c. 528; CNH. xxiii. 382.

Cosalá: Conitaca; Las Trancas, 130 m., *Gonzalez* 820.

Vernacular name "Gatuño blanco".

**A. Rosei** *Standley* in CNH. xx. 187 (1919); CNH. xxiii. 380.

Mazatlan, *Rose*, *Standley and Russell* 13673.

**A. sinaloensis** *Safford* in Journ. Wash. Acad. Sc. iv. 365 (1914).

*A. Hindsii* *Standley* in CNH. xxiii. 375, partim, non *Benth.*

Villa Union, fr. April, *Rose*, *Standley and Russell* 13972.

Apparently distinct from *A. Hindsii*, judging from the description.

**Lysiloma acapulcensis** (*Kunth*) *Benth.*; Trans. Linn. Soc. xxx. 536; CNH. xxiii. 389.—*Acacia acapulcensis* *Kunth.*

Sinaloa (fide Standley).

Vernacular names "Tepeguaje", "Tepehuaje".

**L. Schiedeana** *Benth.* in Hook. Lond. Journ. Bot. 1844, iii. 83; Bot. Sulph. 91, t. 31; Trans. Linn. Soc. xxx. 535.—*L. divaricatum* *Macbride*, sed vix *Mimosa divaricata* *Jacq.*; CNH. xxiii. 390.

Sinaloa (fide Standley).

Vernacular name "Tepeguaje".

*Lysiloma Schiedeana*, though dedicated to Schiede, was actually described by Benthham from specimens collected by Sinclair on the west coast of Central America. Schiede's specimen from the Hacienda de la Laguna, Vera Cruz, consisted merely of a sterile branch. Hence Sinclair's specimen should be regarded as the type of *L. Schiedeana*. Benthham considered

*Mimosa divaricata* Jacq. conspecific with *L. Schiedeana*. Macbride accepted this identification and proposed the new combination *Lysiloma divaricata* (Jacq.) for the species. Jacquin (Pl. Hort. Schoenbr. iii. 76, t. 395) both described and figured the calyx-lobes and corolla-lobes of *M. divaricata* as acute, and further described the corolla as glabrous and the pinnae as bearing forty pairs of leaflets. Benth described *L. Schiedeana* as having the corolla externally puberulous, the pinnae bearing twenty to thirty pairs of leaflets, and an examination of Sinclair's specimen shows that the corolla-lobes are obtuse, and the calyx-lobes rounded. There seems to be no reason for uniting the two species.

**L. Watsoni** Rose in CNH. i. 99 (1891): Zoe, v. 200.

Cofradia, Brandegee.

Standley (CNH. xxiii. 390) says that *L. Watsoni* is known only from the vicinity of the type locality, Alamos, Sonora. I have not seen Brandegee's specimen.

**L. sp.**; Zoe, v. 200.

Brandegee (l.c.) records a *Lysiloma* from Sinaloa thus:—"Nearly glabrous, with large semicordate stipules that persist. Collected only in flower. Near the plant collected by Pringle in Rincon Mts., 1884."

**Calliandra Coulteri** S. Wats. in PAA. xvii. 352 (1882); Zoe, v. 199.—*C. formosa* Standley in CNH. xxiii. 388, partim, non Benth.

Near Culiacan, Brandegee.

"A form with 14-15 pairs of narrow leaflets and often four pairs of pinnae." (Brandegee, l.c.).

Standley (l.c.) says that *C. Coulteri* may be distinct from *C. formosa* (Kunth) Benth. Comparison of Palmer 2129 (the type number) with the plate and description of *Acacia formosa* Kunth (Mimos. 102, t. 32) shows that *C. Coulteri* differs in having more numerous and much smaller leaflets, and smaller stipules which are lanceolate and acuminate acute instead of being oblong and obtuse.

**C. grandiflora** (L'Hérit.) Benth. in Hook. Journ. Bot. 1840, ii. 139; et in Hook. Lond. Journ. Bot. 1844, iii. 111; SBH. 282; Benth. in Trans. Linn. Soc. xxx. 557; Hemsl. Biol. i. 357; Zoe, v. 199.—*Mimosa grandiflora* L'Hérit. Sert. Angl. 30 (1788); Ait. Hort. Kew. ed. i, iii. 441 (1789); Andr. Bot. Rep. ix. t. 592 (1810); Ait. Hort. Kew. ed. 2, v. 469 (1813). *Inga anomala* Kunth, Mimos. 70, t. 22 (1820). *Calliandra Kunthii* Benth. (1849). *C. anomala* Macbride in Contrib. Gray Herb. n.s. lix. 4 (1919); CNH. xxiii. 385.

Cerro de Pinal, fl. Dec. 1848, Seemann 1539; Cofradia, Brandegee.

Vernacular name "Cabellito".

Macbride has proposed the new combination *Calliandra anomala* (Kunth) for the Mexican species hitherto commonly known as *C. grandiflora* (L'Hérit.). He maintains that "it is



evident from the description of *Mimosa grandiflora* L'Hérit. that it cannot be the same as Kunth's plant *Inga anomala*, which has the divisions of the pinnae usually distinctly confluent and very oblique at base. I think there is no reasonable doubt but that it is rather referable to *C. Houstoni* (L'Hérit.) Benth., a species which varies in the number of pinnae and the degree to which the leaflets are confluent." But there is convincing evidence that *Mimosa grandiflora* is conspecific with *Inga anomala*. L'Héritier described *M. grandiflora* in 1788 from a plant cultivated "in hortis juxta Londinum, imprimis in horto regio Kewensi." It may be assumed, therefore, that the species cultivated at Kew under that name was true *M. grandiflora*; and a contemporary specimen labelled "*Mimosa grandiflora* Kew. Sept." from the Herbarium of Bishop Goodenough, now in the Kew Herbarium, (see Kew Report, 1880, 64; 1881) agrees with the plate and description of *Inga anomala* Kunth. Another contemporary specimen of this species marked "*M. grandiflora* Hort. Dni. Vere in Kensington Gore 1789" is preserved in the herbarium at the British Museum. *M. grandiflora* was included in the first and second edition of Aiton's *Hortus Kewensis*, so that it was in cultivation at Kew at any rate until 1813. In the meantime it had been figured in Andrew's Bot. Rep. ix. t. 592 (1810), and this figure was cited by W. T. Aiton in the second edition of the *Hortus Kewensis*. Andrew's figure, also, represents *Inga anomala*. There is, therefore, no reason for changing the name *Calliandra grandiflora* (L'Hérit.) Benth. Macbride's suggestion that *Mimosa grandiflora* is synonymous with *M. Houstoni* is somewhat surprising in view of the fact that L'Héritier, who had seen both species in a living state, carefully distinguished them. L'Héritier's diagnostic phrase of *M. grandiflora* may not seem very applicable to *Inga anomala*, but it is utterly irreconcilable with *M. Houstoni*.

The material of *C. grandiflora* from Chihuahua, Sinaloa, and Jalisco may possibly represent a distinct variety or even species. The number of pinnae is, on the whole, fewer, the calyx is smaller in proportion to the corolla, and the indumentum of the flowers is composed of short, stiff, appressed, gray hairs, which gives the inflorescence a very different appearance.

**C. Houstoniana** (Mill.) Standley in CNH. xxiii. 386 (1922).—*Mimosa Houstoniana* Mill.; *Mimosa* sp., Rel. Houst. t. 26 (1781). *M. Houstoni* L'Hérit. Sert. Angl. 30 (1788). *Calliandra Houstoni* Benth.; Trans. Linn. Soc. xxx. 556. *Anneslia falcifolia* Salisb. in W. Hook. Parad. Lond. i. t. 64 (1807). *Acacia metrosideriflora* Schlecht. in Linnaea, xii. 567 (1838). *Acacia americana*, non spinosa, flore purpureo, staminibus longissimis, siliquis planis villosis, pinnis foliorum tenuissimis Houst. ex Mill. Fig. Pl. Gard. Diet. 4, t. 5 (1755).

San Ignacio; Los Sabinos, 280 m., Gonzalez 256.

Vernacular names "Day", "Tabardillo".

In Sinaloa the bark is chewed to harden the gums (Standley).

**C. laevis** *Rose* in CNH. v. 194 (1899); CNH. xxiii. 384.

Near Colomas, *Rose* 1753.

**C. portoricensis** (*Jacq.*) *Benth.*; Trans. Linn. Soc. xxx. 543; CNH. xxiii. 388.—*Mimosa portoricensis* *Jacq.*

Sinaloa (fide *Standley*).

**C. rupestris** *Brandegee* in *Zoe*, v. 199 (1905).—*C. emarginata* *Standley* in CNH. xxiii. 384, partim, non *Benth.*

*Cofradia*, *Brandegee*.

*Standley* (l.c.) reduces *C. rupestris* to *C. emarginata*, but admits that several species may possibly be included under the latter name. According to *Brandegee's* description of *C. rupestris*, the petioles are longer and the peduncles much shorter than in *C. emarginata*.

**Albizzia occidentalis** *Brandegee* in *Proc. Calif. Acad. Ser. 2. iii.* 222 (1893); CNH. xxiii. 390.

Sinaloa (fide *Standley*).

Vernacular names "Palo fierro", "Bolillo", "Aréllano".

**A. tomentosa** (*Micheli*) *Standley* in *Journ. Wash. Acad. Sc.* xiii. 6 (1923).—*Pithecolobium tomentosum* *Micheli* in *Mém. Soc. Phys. Nat. Hist. Genève*, xxxiv. 285, t. 28 (1903).

Sinaloa, *Gonzalez* 4554.

Vernacular name "Palo joso".

**Pithecolobium brevifolium** *Benth.* in *A. Gray, Pl. Wright. i.* 67 (1852); Trans. Linn. Soc. xxx. 592; *Standley* in CNH. xxiii. 397.

Specimens from Sinaloa are probably conspecific (*Standley* l.c.).

Vernacular name "Carbonera".

**P. dulce** (*Roxb.*) *Benth.*; SBH. 282; Trans. Linn. Soc. xxx. 572; CNH. i. 328; CNH. v. 216; CNH. xxiii. 393.—*Mimosa dulcis* *Roxb.*

*Agiabampo*, *Palmer* 800; West coast of Mexico, *Seemann* 2194; "Cultivated about Mazatlan and San Sebastian and naturalized in some parts" (*Seemann*); Mazatlan, *Lamb* 326. San Ignacio; Arroyo de los de Ponce, 260 m., *Gonzalez* 135; "found all through tropical Mexico, where it is probably native, but on account of its rapid growth and delicious fruit it has also been much planted" (*Rose*).

Vernacular names "Guamúchil", "Huamúchil".

**P. lanceolatum** (*Humb. et Bonpl.*) *Benth.* in *Hook. Lond. Journ. Bot.* 1846, v. 105, in obs.; *Pittier* in CNH. xx. 460; *Standley* in CNH. xxiii. 393, partim.—*Inga lanceolata* *Humb. et Bonpl. ex Willd. Sp. Pl. iv. pars 2*, 1005 (1806); *Kunth, Mimos.* 49, t. 15; *DC. Prodr. ii.* 437. *Mimosa lanceolata* *Poir. in Lam. Encycl. Suppl. i.* 37 (1810). *Pithecolobium ligustrinum* *Benth.* in *Trans. Linn. Soc. xxx.* 571, partim.

Mazatlan; Villa Union and Rosario, *Rose, Standley and Russell* 13852, 13950, 14520, *Rose* 3162. San Ignacio; R. de los Chinacates, 90 m., *Gonzalez* 159.

Vernacular name "Conche" (Gonzalez).

The material of *Gonzalez* 159 in the Kew Herbarium consists of three branchlets bearing leaves, but without flowers or fruit. The stipular spines are 1-1.7 cm. long, and the "interpeticular stipules" are subulate, as described by Pittier (l.c.), but the leaflets are pubescent on the lower surface, whereas those of *P. lanceolatum* are glabrous, so far as is known. Flowering material is required in order to verify the identification.

Pittier, who has made a special study of the spicate-flowered species of *Pithecolobium* of the *unguis-cati* section (l.c. 455-464), treats *P. lanceolatum* (Humb. et Bonpl.) and *P. ligustrinum* (Jacq.) as independent species, but Standley (CNH. xxiii. 393) follows Bentham in uniting them. For the combined species Standley adopted the name *P. lanceolatum*, being under the impression that *Mimosa ligustrina* Jacq. was published in 1809, subsequently to *Inga lanceolata* Humb. et Bonpl. (1806) and *Mimosa ligustrina* Vahl (1807). But as Willdenow (Sp. Pl. iv. pars 2, 1007; 1806) cited *Mimosa ligustrina* Jacq. Fragm. 29, t. 32, it is evident that the latter was published previously. The combined species should therefore bear the name *Pithecolobium ligustrinum* (Jacq.) Klotzsch ex Benth.

**P. ligustrinum** (Jacq.) Klotzsch ex Benth. in Trans. Linn. Soc. xxx. 571 (1875), partim; emend. Pittier in CNH. xx. 461 (1922).—*Mimosa ligustrina* Jacq. Fragm. 29, t. 32, fig. 5 (1800-1806). *Inga ligustrina* Willd. Sp. Pl. iv. pars 2, 1007 (1806); DC. Prodr. ii. 437 (1825). *Pithecolobium lanceolatum* Standley in CNH. xxiii. 393, partim.

Culiacan, Brandegee.

**P. mexicanum** Rose in CNH. i. 100 (1891); CNH. xxiii. 397. Sinaloa (fide Standley).

**P. pulchellum** Pittier in CNH. xx. 462 (1922). Culiacan, Brandegee.

**P. sonorae** S. Wats. in PAA. xxiv. 49 (1889); CNH. xxiii. 397. Sinaloa (fide Standley). Vernacular name "Palo gato".

**P. unguis-cati** (L.) Benth. in Hook. Lond. Journ. Bot. 1844, iii. 200; Standley in CNH. xxiii. 394.—*Mimosa unguis-cati* L. Sinaloa (fide Standley).

It is possible that this may prove to be some other species. On account of the known geographical distribution of *P. unguis-cati*, its occurrence in Sinaloa is improbable.

Standley ascribes the combination *P. unguis-cati* (L.) to Martius, Hort. Monac. 188 (1829), but this publication is invalid under International Rules, as the genus *Pithecolobium* was not described until 1837.

**Enterolobium cyclocarpum** (Jacq.) Griseb.; CNH. v. 228; CNH. xxiii. 391.

Colomas, Rose 1759.

Vernacular names "Huinecastle", "Huinecaztle", "Huina-castle".

The bark is used as a soap and in tanning (Rose). The gum which exudes from the trunk is employed in Sinaloa as a remedy for bronchitis (Standley).

**Inga eriocarpa** Benth. in Hook. Lond. Journ. Bot. 1845, iv. 615; Hemsl. Biol. i. 362; CNH. xviii. 212; CNH. xxiii. 399.

Sinaloa (fide Standley).

Vernacular name "Vainillo".

Bentham (Trans. Linn. Soc. xxx. 628, in obs.) says that *I. eriocarpa* may be the same species as *I. xalapensis* Benth. *I. eriocarpa* appears to differ in the scarcely acuminate, more coriaceous leaflets, and in the bracts being ovate instead of lanceolate.

**I. oophylla** Riley, sp. nov.; affinis *I. eriocarpae* Benth., foliolis ovatis vel ovato-lanceolatis haud coriaceis apice valde mucronatis, indumento sparsiori differt; ab. *I. xalapensi* Benth. foliolis ovatis nunquam acuminatis multo latioribus, indumento sparsioribracteis minoribus, inflorescentiis multo laxioribus, floribus paucioribus facile distinguitur.

*Caules* subflexuosi, ferrugineo-tomentosi, lenticellis prominentibus. *Folia* rhachi communi (petiolo incluso) 1.6 dm. longa, ferrugineo-tomentosa, internodiis alatis, alis anguste ellipticis, apice basique angustatis, 2.3-5 cm. longis, 7-9 mm. latis, utrinque sparse pilosis, nodo quoque glandulam albescentem gerente; foliola 4-5-juga, ovata vel ovato-lanceolata, basi oblique subcordata, apice obtusa vel subacuta, valde mucronata, 5.5-12.5 cm. longa, 3.2-4.8 cm. lata, supra nitida, subtus opaca, utrinque sparse pilosa, costa supra densius obtecta. *Inflorescentia* spicata, laxa, 6-7 cm. longa, circiter 7-flora, floribus sessilibus, ubique, corolla excepta, ferrugineo-tomentosa. *Bracteae* ovatae vel ovato-lanceolatae, obtusae, 5-7 mm. longae, 2-5 mm. latae. *Calyx* tubuloso-campanulatus, 1.8 cm. longus, dentibus triangulatis acutiusculis 5-7 mm. longis. *Corolla* 2.5 cm. longa, extus dense sericea, intus glabra, dentibus triangulato-ovatis acutiusculis circiter 6 mm. altis, basi circiter 4 mm. latis. *Stamina* corollam longe superantia ad 7 cm. attingentia. *Ovarium* sessile, quadrangulatum, glabrum. *Legumen* non vidi.

Sinaloa: San Ignacio; El Bosque, 110 m., Gonzalez 250 (type in Herb. Kew).

Vernacular name "Vainillo".

**I. xalapensis** Benth. in Hook. Lond. Journ. Bot. 1845, iv. 616; Trans. Linn. Soc. xxx. 628; Hemsl. Biol. i. 364; CNH. xviii. 216; CNH. xxiii. 399.

Sinaloa (fide Standley).

Vernacular name "Vainillo".

The wood is used for fence posts (Standley).



### XLIII.—VISIT OF HER MAJESTY THE QUEEN.

Her Majesty the Queen was graciously pleased to pay a visit to the Royal Botanic Gardens, on Tuesday, November 27th in order to plant a specimen of the Maidenhair Tree (*Ginkgo biloba*) on the site of the Temple of the Sun, which was destroyed in the gale of March 1916.

The Temple of the Sun was built in 1761 for Princess Augusta of Saxe-Gotha, Dowager Princess of Wales, from the designs of Sir William Chambers, and occupied a position at about the centre of the Botanic Garden which Her Royal Highness had founded in 1760 and which was the origin of the present Gardens.

Near the site of this Temple stands the fine Maidenhair Tree planted between 1760 and 1762 either by the Princess of Wales or by her botanical adviser, the Earl of Bute, and Her Majesty, by planting a young Ginkgo Tree on this historic spot, has in a very interesting manner maintained the Royal interest in Kew which has existed since 1730, when Frederick Prince of Wales obtained a lease of the property from the Earl of Essex.

The ceremony was a purely private one. Her Majesty was received at the Main Gate of the Gardens by the Director, and walked to the site where the Curator and the tree movers were in waiting, a young tree having been moved into position with the transplanting machine. After the machine and coverings had been taken away and the ball of earth holding the roots laid bare, Her Majesty, using an ordinary garden spade, placed several spits of earth on the roots of the tree.

Before leaving she spoke for some time with each of those who had been concerned with the moving of the tree, and enquired about the surrounding trees, some of which are the oldest exotic specimens in the Gardens. The fine old Ginkgo was also inspected, and Her Majesty was pleased to accept a pressed spray bearing the leaves, and also a photograph of the tree and one showing the Temple of the Sun.

It was very unfortunate that a dense fog enveloped the Gardens on the morning of the planting, yet despite the fog and cold, Her Majesty braved the adverse conditions and most kindly carried out the task which she had promised to perform.

---

### XLIV.—MISCELLANEOUS NOTES.

DR. S. C. HARLAND.—We learn that Dr. S. C. Harland formerly of the Agricultural Experiment Station, St. Croix, and later Assistant Agricultural Superintendent, St. Vincent, has been appointed Professor of Botany at The Imperial College of Tropical Agriculture, Trinidad, in succession to Mr. T. G. Mason transferred to Nigeria. (*K.B.* 1914, p. 345; 1915, p. 181.)

---

Mr. V. H. KIRKHAM, late Director of Chemical Research, Kenya, has been appointed, by the Secretary of State for the Colonies, Director of Agriculture, Zanzibar.

LIEUT. A. G. BEATTIE has been appointed by the Secretary of State for the Colonies on the recommendation of Kew, Superintendent, Agricultural Department, Nigeria.

LORD VENTRY.—We record with regret the death of Lieutenant Colonel Lord Ventry, D.S.O., in September. In his later years he took a keen interest in the growing of New Zealand Flax on his estate in Kerry, where it flourished remarkably well. An account of his experiments were published in *K.B.* 1919, p. 169, with illustrations showing the growth of the plant at Burnham, Dingle, Co. Kerry. He was a frequent and always an interesting correspondent of Kew with regard to his experiments with Flax Cultivation, which he pursued with great patience and an optimism that deserved to be rewarded with commercial success.

**Retirement of Mr. G. T. Lane.**—In February last Mr. G. T. Lane retired from the post of Curator of the Royal Botanic Gardens, Calcutta. Mr. Lane entered Kew as a young gardener in 1889 and after two years' service was appointed Assistant Curator of the Calcutta Gardens, of which he became Curator in 1894.

The Annual Report of the Royal Botanic Gardens, Calcutta, for 1922-23, contains the following record of Mr. Lane's service:—

"With Mr. Lane's retirement on the 2nd February 1923 Government loses an officer of long and faithful service. He first joined the garden staff some thirty-two years ago under the then Superintendent, Sir George King, who early formed a high opinion of his character and abilities. Mr. Lane saw service under several Superintendents and acting Superintendents, and it is sufficient to say that all have left records endorsing the high opinion of him which Sir George King was first in a position to form. His relations with garden labour were particularly happy. Firmness combined with sympathy and tact were amongst Mr. Lane's natural gifts enabling him to command as loyal service from those placed in his charge as he himself never failed to give."

Mr. Lane has been succeeded as Curator at Calcutta by Mr. W. V. NORTH. (*K.B.* 1912, p. 392.)

**The Imperial College of Tropical Agriculture.**—At a meeting of the West Indian Agricultural College held at the Colonial Office on 3rd October 1923 it was decided that the name of

this Institution should be changed to "The Imperial College of Tropical Agriculture" (*K.B.* 1920, p. 81; 1922, pp. 255, 302).

---

**Paintings of Burmese and Madras Plants.**—Colonel W. G. King, I.M.S. (retd.), C.I.E., whose contribution to the library of 10 albums of original paintings of Burmese and Madras plants was announced in the *Kew Bulletin*, 1922, p. 42, has recently presented five other albums of paintings of Burmese plants. The 15 albums contain altogether 1,017 paintings of which 649 were done in Burma and 368 in Madras. All are the unaided and untutored work of his wife, now deceased, accomplished during the years 1886 to 1910. While it is not claimed for these paintings that they possess great artistic merit, they appear on the whole to be faithful representations, and their value is much enhanced owing to the fact that in many instances fruiting specimens have been depicted. There are more than 100 paintings of Burmese Cucurbitaceae, mostly including fruits, and many of them have been furnished with names which have been corrected or verified by the late Mr. R. A. Rolfe. Much of the work of identification remains to be done, and it is probable that in some cases it can never be completed satisfactorily, for no botanical artist, however talented, is likely to be so fortunate as to succeed, without instruction and supervision, in delineating all the essential characters by which a species may be recognised and distinguished from its allies. Mr. J. S. Gamble has kindly looked over the Madras collection and has tentatively named a portion of it. The paintings have been carefully and neatly mounted, partly, if not entirely, by Colonel King himself, who has also prepared typed lists of them, giving localities and dates where and when the plants were found, such names as have been supplied, and occasional remarks by Mrs. King.

---

**The Kendall Australian Collection.**—The Australian collection in the Herbarium has recently received a useful addition through the kindness of the Council of the Royal Geographical Society, by the presentation of about 130 specimens collected by Mr. R. J. Kendall in the sixties, in the vicinity of Castlemain, Victoria. The plants are well pressed and mounted, and form a welcome addition to a flora which is none too well represented at Kew.

---

**Flora of West Africa.**—With the approaching completion of the Flora of Tropical Africa, it has been arranged with the Colonies concerned, through the Secretary of State for the Colonies, that a handbook on the flora of West Africa shall be prepared at Kew. This project has been contemplated at Kew for some time and in fact was actually indicated by Sir William Hooker in his memorandum to the Colonial Office in 1863 when he detailed the series of floras required for the Colonies (*K.B.*

1905, p. 20). The demands made by the larger Flora, however, have so far prevented this work being undertaken.

The need of floras dealing with special areas but based on the standard Flora of the Country has already been appreciated in the case of India where the Flora of British India has been followed by the local floras of Bombay, Madras, etc. These local floras have been or are being written by distinguished Indian botanists and the work has been done almost entirely at Kew, the Government of India finding the necessary funds for the purpose.

The retirement of Dr. J. M. Dalziel from the West African Medical Service appeared to be a unique opportunity of securing the services of an officer well acquainted with West Africa and who was known to have taken a keen interest in the local flora during his long residence on the Coast. With this assistance, and that of Mr. J. Hutchinson, who has for so many years devoted his attention to African work in the herbarium at Kew, it has now been possible for work on the local flora to be begun.

The handbook is intended to follow the lines of the local Indian floras and to be illustrated by outline sketches of the more important flowers and plants. The area to be considered will include the four British West African Colonies and Protectorates and as much of the hinterland and intervening country as comprise the common Upper Guinea flora.

---

**Donation of a Microscope.**—An important addition to the apparatus at Kew is due to the generosity of Mr. P. G. Dallinger, who has very kindly presented a valuable microscope for the use of the Staff or Students.

The instrument consists of a Zeiss stand with mechanical stage finder, sub-stage condenser and diaphragms, one objective (16 mm.) and three compensating eyepieces by Zeiss, one ordinary eyepiece, a  $\frac{1}{8}$ -inch objective by Baker and a  $\frac{1}{12}$ -inch immersion lens by Reichert.

The microscope is in excellent order, the donor having arranged for a thorough overhauling of the instrument to be carried out before presenting it to Kew.

---

**The National Herbarium of the Union of South Africa.**—The Botanical Survey of the Union of South Africa was established in the year 1918, as recorded in the *Kew Bulletin* 1919, p. 399, and one of its principal aims was that a Central Herbarium should be established at the headquarters of the Survey at Pretoria. We learn with interest that this has now been accomplished, the Central Herbarium having been opened on July 20th by General Smuts, the Prime Minister.

General Smuts, as reported in the *Rand Daily Mail*, gave a remarkably interesting scientific address on this occasion, showing how wide is his grasp of South African botany and its needs.



The foundation of this herbarium, he pointed out, has been preceded by three others. The first was the Natal Herbarium which was built up by Dr. Medley Wood, then came the magnificent Bolus collection at Cape Town, now belonging to the Cape University, which was made by one who had devoted his ability and time to botanical collection and research, while the third was the Government herbarium at Cape Town, started many years ago and containing many notable specimens. Most of these specimens were referred to in the earlier volumes of the *Flora Capensis*.

The herbarium which he was about to open was, he said, the youngest since the Boer War. The man who started it was Mr. Burt Davy, ably assisted by Mrs. Sydney Stent. On the whole, though he would not say this collection was as great or notable as some of the others, it was already a magnificent one containing well over 35,000 named and mounted specimens. Not only was it a phanerogamic collection but there was also a collection of cryptogams containing the best collection of South African fungi in existence. This collection consists of over 25,000 specimens, and to it will be added Dr. Sim's fine collection from Natal.

Referring to the Botanical Survey, General Smuts said that this was not only of extreme importance, but afforded in many respects an example to other countries. This Survey was presided over by Dr. Pole-Evans, and its success was largely due to his energy and ability.

The Herbarium was an encyclopaedia, the store-room and the laboratory of a botanist, and no progress could be made in botany unless they had a first-class herbarium.

After referring to many interesting points in connection with the flora of the Cape Region, General Smuts pointed out that it was quite possible that proper and intensive study of the botany of South Africa would throw light on many of the great problems that were puzzling the botanists of the world.

Proceeding, he emphasised the fact that if they wanted to know properly the botany of South Africa they would have to review the botany of the African Continent as a whole. "You want a Kew", he said, "What Kew is to England and the British Empire, this national herbarium must be to South Africa. You want here a herbarium to which you can bring together all that vast material of the African Continent which will enable you to see the plant distribution of the whole continent, and then only will you be able to answer some of the questions of the past."

In referring to South Africa's need of a Kew, General Smuts, as reported, made no allusion to the "botanic garden" side of Kew which is already in existence in the National Botanic Garden at Kirstenbosch. It is quite true, as he so ably points out, that a comprehensive herbarium is essential to our knowledge of the flora of a country, but the garden side where the living plant can be studied is of equal importance. It is therefore

much to be hoped that while doing all it can to further the work of the Botanical Survey and help forward the Herbarium, which has been opened under such auspicious circumstances, the Government of South Africa will not in any way neglect to give adequate assistance to the National Botanic Garden, Kirstenbosch. This garden, which was started largely through the initiative of the late Professor Pearson, has great possibilities, and from the Reports that have reached us it does not appear to have received its due meed of recognition and support from Government. We venture to express the hope that a Government which is so enlightened in matters botanical and agricultural as is that of the Union of South Africa, now that it has established so essential an Institution as a National Herbarium, will not neglect its National Botanic Garden, which was founded so wisely a few years ago.

South Africa is singularly fortunate in possessing not only a remarkable flora, which must be most zealously guarded and studied, but also a Prime Minister who knows it so well and appreciates to the full its value and interest. To achieve the attainment of the ends that General Smuts has outlined a Botanical Garden as well tended and provided for as may be possible is essential. In the past the foundation of the Garden has usually preceded the establishment of the Herbarium, but in South Africa the Herbarium appears to have received the greater attention. The new National Herbarium alone cannot be to South Africa what Kew strives to be to Great Britain and the Empire any more than can the Kirstenbosch Garden represent every side of Kew's activities.

If, however, the New National Herbarium and the complementary National Botanic Garden at Kirstenbosch can be coupled together in the matter of adequate financial support so that their united work may be National not merely in name but in fact, then the Union of South Africa will indeed possess a worthy counterpart of "Kew" fitted to answer the botanical and agricultural problems that confront the Country.

---

**Cascara Sagrada.**—Considerable interest was aroused a few years ago by a series of articles which appeared in the *Kew Bulletin* on the possibility of the cultivation of *Rhamnus Purshiana* on a commercial scale in the British Isles. The following extract from the Report of the Administrative Chairman of the Honorary Advisory Council for Scientific and Industrial Research of Canada, 1922, indicating that the wood is practically as active as the bark, should prove of value to those interested in the experimental cultivation of these trees.

"The investigations made indicate that the results obtained by storing the bark of the Cascara Sagrada for three years previous to use, can be produced quickly by chemical means; for this purpose the bark is submitted to the action of hydrogen peroxide, and tests made at the Vancouver General Hospital with

bark so treated have been satisfactory. The Cascara Sagrada wood was next examined to see if it contained enough active constituent to pay for extraction; solutions are being tested at the Vancouver General Hospital and by the Parks, Davis Company, Detroit. A preliminary report from the hospital shows the surprising result that the wood is practically as active as the bark, and this result, if fully confirmed, will mean a wonderful conservation of the fast disappearing Cascara tree, as the bark does not constitute more than 5 per cent. of the tree."

The trees at Kew continue to thrive well. The largest, raised from seed sent by Mr. Luther Burbank in 1891, is now 25 ft. high, its trunk (at 3 ft. from the ground) 2 ft. 10 ins. in girth. It is therefore approaching maturity, the dimensions of trees wild in Western North America being given as 20 to 40 ft. in height, the trunk 1 foot or more in diameter. Young trees raised from seed produced at Kew in 1914 are 11 ft. 6 ins. high.

---

**Castor Seed and Oil** (*Ricinus communis*).—Considerable interest during the last few years has been taken in this well-known product, of which our chief source in pre-war days was British India (1,203,355 cwt. of seed and 6,640 cwt. of oil imported in 1913), with smaller supplies from foreign countries—Italy, United States, &c. The following note (from the Monthly Bulletin of Agric. Intell., International Institute, Rome, Dec. 1922, p. 1499) may be of interest as showing the developments in Brazil.—“During the war the cultivation of the Castor-oil plant developed enormously in the State of Sao Paulo; it then decreased in importance owing to the rapid fall in prices and difficulties of preparation. At present the export demand has again increased considerably. In 1920 from the port of Santos alone 360,000 bags of castor-oil seed were exported and in 1921 230,000 bags over and above the quantities prepared in Brazilian factories, which have considerably increased their machinery. The price for the first half of 1922 was 460 reis (about 8*d.*) per kilogramme of unhusked seed and 500 reis (8*d.*) for machine husked seeds, or 25 milreis (at 16*d.* = 33*s.* 4*d.*) per bag of 50 kilogrammes. The exporting firms are constantly receiving large orders from Europe and America.” In the same Bulletin (p. 1498) cultivation for the French market is strongly recommended in Morocco, where “in the coast zone the climate is very favourable for growing the plant, which lives for about 10 years, assuming an arborescent form; the heavy night dews here render irrigation unnecessary.”

The cake after the extraction of the oil is not suitable for feeding cattle, and it is generally used as manure on coffee and other plantations.

The Castor-oil plant was recommended for cultivation in the warmer parts of the British Empire in *Kew Bull.* Nos. 7-8,

1917, p. 245, and particulars of the cultivation, extraction of the oil and uses are given in the *Kew Bull.*, Add. Series ix, part 4 (1922), pp. 607-611.

J. H. H.

**The Botanical Magazine.**—The fourth and concluding part of the new issue of the Botanical Magazine, completing volume cxlviii, has now been issued and maintains the standard set up in the first part.

The plants figured in Parts ii, iii and iv, which have been issued during 1923, though the volume belongs to the previous year, are as follows :—

Part ii.—*Rhododendron sulfureum* Franch. (t. 8946), from South-west China; *Euphorbia anoplia* Stapf (t. 8947), a new dioecious species from South Africa presented by the late Mr. Elwes to the Royal Botanic Gardens, Kew; *Malus toringoides* Hughes (t. 8948), a native of Szechuan originally collected by General-Consul Hosie and Mr. Wilson in 1904; *Maxillaria Fletcheriana* Rolfe (t. 8949), collected by Forget in Southern Peru; *Amorphophallus coffeatus* Stapf (t. 8950), a striking new Aroid collected in Rhodesia and flowered at Kew; *Echinocactus undulatus* Dietr. (t. 8951), from Mexico presented by Mr. Elwes to Kew; *Dracocephalum Isabellae* Forrest (t. 8952), a handsome garden plant collected by G. Forrest in North-West Yunnan; *Rhododendron planetum* Balf. f. (t. 8953), from China probably W. Szechuan; *Cirrhopetalum tripudians* Parish et Reichenb. (t. 8954), collected in Burma by Parish and in Siam by Dr. Kerr; *Lachenalia convallariodora* Stapf (t. 8955), an interesting new South African species and *Lonicera Griffithii* Hook. f. & Thoms. (t. 8956), with pink flowers and dimorphic leaves from the Afghan Indian borderland.

Part iii contains the following plates :—*Isotrema chrysops* Stapf (t. 8957), a new hardy Aristolochiad collected by Henry and by Wilson in China; *Prunus incisa* Thunb. (t. 8958), from Japan; *Milletia dura* Dunn (t. 8959), a slender tree or climbing shrub from Equatorial Africa flowered at Kew from seed sent by Mr. M. T. Dawe; *Lilium centifolium* Stapf (t. 8960), from China; *Dictamnus albus* L. var. *caucasicus* Rouy (t. 8961), a native of the Crimea and Caucasus; *Deutzia pulchra* Vidal (t. 8962), from the Philippines and Formosa; *Rhododendron Cantabile* Balf. f. (t. 8963), a new Chinese species of Forrest's collecting in the mountains N.E. of Chungtien; *Xerophyllum tenax* Nutt. (t. 8964), the Skaw or Indian Basket grass of N.W. America; *Cypripedium himalaicum* Rolfe (t. 8965), from the Himalaya and Western China; *Rhipsalis Warningiana* K. Schum. (t. 8966), a native of Brazil and *Veronica pimeleoides* Hook. f. (t. 8967), an interesting species from the South Island, New Zealand, introduced to cultivation over thirty years ago.

Part iv contains plates of the following plants :—*Hemerocallis nana* G. Forrest & W. W. Smith (t. 8968), from the mountains



of N.W. Yunnan; *Picca brachytyla* Pritzel (t. 8969), also from Western China; *Clethra Delavayi* Franch. (t. 8970), a very beautiful Chinese shrub or small tree with a white corolla and deep rose or red calyx; *Echinocereus Baileyi* Rose (t. 8971), from North America; *Carmichaelia australis* R. Br. (t. 8972), from New Zealand where it was discovered by Sir J. Banks and Dr. Solander in 1769; *Rhododendron sinogrande* Balf. f. & W. W. Smith (t. 8973), from South West Yunnan, the Chinese representative of the Himalayan *R. grande*; *Gentiana rigescens* Franch. (t. 8974), from China; *Haemanthus Lynesii* Stapf (t. 8975), a new species collected at Darfur on the Lake Chad-Nile divide by Admiral Lynes in 1921 and flowered by the late Mr. Elwes; *Wattakaka sinensis* Stapf (t. 8976), a climbing Asclepiad from Western China and *Echium coeleste* Stapf (t. 8977), a beautiful new species from the Canary Islands raised at Kew from seeds sent over by the late Dr. G. V. Perez of Orotava.

The volume is very fittingly dedicated to Mr. George Forrest to whose energy and sagacity in his expeditions in China both Botanists and Horticulturists are so deeply indebted.

---

**The Vegetation and Soils of Africa\*.**—To attempt a review of the vegetation and of the soils of Africa in one small volume is a task that must have been as unsatisfactory to the authors as it is to the readers. More especially is this the case when the authors state that a careful digest has been made of the bibliography which is enumerated in twenty eight pages, as well as many other works they have not cited. It is to be hoped that the vast amount of information which the authors have accumulated in their appreciation of these works will not be confined to these few pages but will be continued in further publications of this series.

Both authors strike an entirely new note in their studies of the vegetation and soils of Africa. The vegetation is treated and summarised on its distinctive physical and physiological features, its floristic composition and affinities not being considered. For instance the Cape vegetation and the "maqui" of the Mediterranean are put in the same class under the heading of Temperate Brush. Even so the author distinguishes twenty-one types. The treatment of the soils is also a new departure for Africa and some very interesting deductions are given as to the possible, or previous, extent of types of vegetation. The synopses on present day agriculture, and the assessment of the types of land in terms of productivity render the book eminently suitable for agriculturists.

---

\* The Vegetation and Soils of Africa. H. L. Shantz and C. F. Marbut. Research Series, No. 13. American Geographical Society, Broadway at 156 Street, New York, pp. 262, x, 50 illustrations and two maps. Price \$5.

The two maps each with an inset illustrating the distribution of vegetation, soil, rainfall and land classification are a valuable addition. The authors are to be congratulated on so lucidly introducing these studies of Africa, and the American Geographical Society on the production of this neatly bound and well illustrated work.

---

**The Siamese Flora**†.—The Botanical Section of the Ministry of Commerce, Siam, was formed in 1920 with the object of making a survey of all known and possible economic plants of the country. The result of the 1922 tour has recently been published in *The Record*, the organ of the Board of Commercial Development, Siam, English Edition No. 9. In addition to the very interesting account of the tour of the Botanical Section there is an article on the Cultivation of "Miang" or Siamese tea. The author considers that although there is not likely to be any extension of the trade for the product as marketed at present, there is no reason why, with proper methods, good tea should not be produced in almost unlimited quantities.

---

We record with great regret, as this number goes to the printers, the death of MR. T. F. CHEESEMAM of New Zealand, on 15th October 1923. A notice of his contributions to botanical science will appear in the next number of the *Bulletin*.

---

† Issued by the Ministry of Commerce, Bangkok, Price 1 tical.

## INDEX.

## A.

- Acacia cymbispina* *Sprague et Riley*, 394.  
*Actephila aurantiaca* *Ridl.*, 360.  
*Actephilopsis* *Ridl.*, nov. gen., 360.  
 ——— *malayana* *Ridl.*, 361.  
*Aeschynomene bracteolaris* *Riley*, 115.  
 Africa, The Vegetation and Soils of, 410.  
 Agriculture, Tropical, Imperial College of, 403.  
*Andrachne australis*, 361.  
 ——— *calcareae* *Ridl.*, 361.  
 ——— *hirta* *Ridl.*, 362.  
*Andrographis Lawsoni* *Gamble*, 375.  
*Anoda urophylla* *Riley*, 110.  
*Antidesma hirtellum* *Ridl.*, 366.  
 Appointments :—  
   Beattie, A. G., 403.  
   Dowson, Capt. W. B., 94.  
   Gilbert, Lieut. S. M., 43.  
   Harland, Dr. S. C., 402.  
   Hill, A. G. G., 303.  
   Kirkham, V. H., 403.  
   Lewin, Lieut. C. J., 43.  
   Lyne, F. S., 94.  
   Marquand, C. V. B., 128.  
   Martin, Capt. R. F., 303.  
   Mason, T. G., 128.  
   Nicholas, H., 94.  
   North, W. V., 403.  
   Shepherd, E. F. L., 43.  
   Staples, Capt. E. G., 43.  
   Walters, E. A., 43.  
 Australian Forest Botany, Text-book of, 351.  
 Austria and Germany, Botanists in, 272.

## B.

- Bacterial Nodules of Rubiaceae, 346.  
 Balfour, Sir I. B., 30.  
 Bamboos, *Neohouzeaua*, a new genus of (with figs.), 89.  
 Beattie, A. G., 403.  
*Berlinia globiflora* *Hutch. et B. Davy*, 162.  
 Birschel, F. W., 351.

## Books :—

- Botanical Magazine, 409.  
 Dates and Date Cultivation of the Iraq, 271.  
 Destructive Distillation of Wood, 270.  
 Flora of Madras, 128.  
 Forest Officers' Handbook of the Gold Coast, 96.  
 Fruit Cultivation in Trinidad and Tobago, 268.

## Books—cont.

- Indian species of *Eriocaulon*, 303.  
 List of common trees, shrubs, etc., in Siam, 272.  
 Menzies' Journal of Vancouver's Voyage, 269.  
 Official Guide to the Botanic Gardens, Dominica, 352.  
 Pears of New York, 188.  
 Plant Names, 191.  
 Text-book of Australian Forest Botany, 351.  
 Vegetation and Soils of Africa, 410.  
 Botanical Magazine, 409.  
 ——— Original Drawings of, 176.  
 Botanists in Germany and Austria, 272.  
 Botany, Chinese, 96.  
*Brachiaria argentea* *Hughes*, 315.  
 ——— *foliosa* *Hughes*, 315.  
 ——— *holosericea* *Hughes*, 315.  
 ——— *piligera* *Hughes*, 315.  
 ——— ——— var. *intercedens* *Hughes*, 315.  
 ——— *polyphylla* *Hughes*, 315.  
 ——— *ramosa* var. *grandiflora* *Hughes*, 315.  
 Brachystegia, revision of (with plates and figs.), 129.  
 ——— *Allenii* *Hutch. et B. Davy*, 156.  
 ——— *apertifolia* *Hutch. et B. Davy*, 154.  
 ——— *Bakeriana* *Hutch. et B. Davy*, 159.  
 ——— *edulis* *Hutch. et B. Davy*, 162.  
 ——— *filiformis* *Hutch. et B. Davy*, 150.  
 ——— *Gairdnerae* *Hutch. et B. Davy*, 161.  
 ——— *glauescens* *Hutch. et B. Davy*, 152.  
 ——— *Gossweileri* *Hutch. et B. Davy*, 152.  
 ——— *leonensis* *Hutch. et B. Davy*, 156.  
 ——— *Lujae* *De Wild.*, 157.  
 ——— *mimosaeifolia* *Hutch. et B. Davy*, 153.  
 ——— *obliqua* *Hutch. et B. Davy*, 160.  
 ——— *puberula* *Hutch. et B. Davy*, 156.  
 ——— *reticulata* *Hutch. et B. Davy*, 154.  
 ——— *Taubertiana* *Hutch. et B. Davy*, 150.  
 ——— *utilis* *Hutch. et B. Davy*, 155.  
 ——— *venosa* *Hutch. et B. Davy*, 158.  
*Bromelia Magdalenae* *C. H. Wright*, 267.

- Buchnera minor* Riley, 117.  
*Bulgaria*, *Xanthium spinosum* in Neolithic deposits in, 190.  
 Burr, Sydney, and Millard, W. A., Causative Organism of Skin spot of Potatoes, 273.  
*Bursera acutidens* Sprague et Riley, 169.  
 — *arborea* Riley, 167.  
 — *attenuata* Riley, 167.  
 — *lonchophylla* Sprague et Riley, 168.  
 — *occidentalis* Riley, 168.  
 — *pilosa* Riley, 168.  
 — *rubra* Riley, 168.  
 — *sphaerocarpa* Sprague et Riley, 170.  
 — *stenophylla* Sprague et Riley, 169.  
 Burt Davy, J., and Hutchinson, J., a revision of *Brachystegia*, 129.  
 Buttresses, 175.  
 C.  
*Calanthe pubescens* Ridley, 117.  
*Calliandra confusa* Sprague et Riley, 371.  
 — *similis* Sprague et Riley, 372.  
*Caloncoba ficifolia* Chipp, 266.  
*Cascara Sagrada*, 407.  
*Castor Seed and Oil*, 408.  
*Cedar Wood*, uses for, 94.  
*Cephalomappa penangensis* Ridl., 368.  
*Ceuthospora* and *Cytosporina*, the British species of, 353.  
 — *Hederæ* Grove, 355.  
*Ceylon*, *Peradeniya*, New Laboratories, 63.  
 Cheeseman, T. F., 411.  
*Chinese Botany*, 96.  
*Chrysalidocarpus glaucescens* Waby, 376.  
*Citrus Industry in Fiji*, 261.  
 Classification of Flowering Plants, Phylogenetic, Contributions towards a (with figs. and maps), 65, 241.  
*Cleistanthus albidiscus* Ridl., 360.  
*Clematis altissima* Hutchinson, 180.  
*Cnesmone subpeltata* Ridl., 368.  
*Coffee and Para Rubber in Uganda*, 185.  
 College of Tropical Agriculture, Imperial, 403.  
*Comocladia macrophylla* Riley, 175.  
*Crotalaria polyphylla* Riley, 333.  
 — *rotundifolia* var. *brachytricha* Sprague et Riley, 334.  
*Croton calcicola* Ridl., 366.  
*Curcuma sulcata* Haines, 119.  
*Cyrtococcum oxyphyllum* Stapf, 330.

- Cytospora*, the British species of, 1.  
 — *Lonicerae* Grove, 18.  
 — *Symphoricarpi* Grove, 26.  
*Cytosporina* and *Ceuthospora*, the British species of, 353.  
 — *Acharii* Grove, 358.  
 — *flavovirens* Grove, 358.

## D.

- Dalea Goldmani* Riley, 337.  
 — *occidentalis* Riley, 337.  
 — *Palmeri* Riley, 337.  
 — *pumila* Riley, 337.  
 — *roseiflora* Riley, 337.  
 — *sericocalyx* Riley, 338.  
*Dasylepis Blackii* Chipp, 265.  
 — *brevipedicellata* Chipp, 265.  
 Dates and Date Cultivation of the Iraq, 271.  
 Dear, G., retirement of, 268.  
 Decades Kewenses, 115, 371.  
*Desmodium rubricaula* Riley, 344.  
 Diagnoses Africanæ, 180.  
*Dicoma*, revision of, 377.  
 — *Galpinii* F. C. Wilson, 385.  
*Didymocarpus Fischeri* Gamble, 117.  
*Digitaria ammophila* Hughes, 313.  
 — *Baileyi* Hughes, 311.  
 — *Brownei* Hughes, 313.  
 — var. *monostachya* Hughes, 313.  
 — *coenicola* Hughes, 313.  
 — *ctenantha* Hughes, 310.  
 — *diminuta* Hughes, 312.  
 — *divaricatissima* Hughes, 314.  
 — *macractenia* Hughes, 314.  
 — *orbata* Hughes, 312.  
 — *parviflora* Hughes, 311.  
 — *recta* Hughes, 311.  
 — *robusta* Hughes, 310.  
 — *stenostachya* Hughes, 311.  
 — *striata* Hughes, 311.  
 — *tenuissima* Hughes, 312.  
 — *tonsa* Hughes, 313.  
 Distillation of Wood, Destructive, 270.  
 Dixon, H. N., and Gepp, A., Rehmann's South African Mosses, 193.  
*Dominica Botanic Gardens*, Official Guide, 352.  
 Dowson, Capt. W. B., 94.  
*Drypetes pendula* Ridl., 365.  
 — *riparia* Ridl., 365.  
 Dummer, R. A., 94.  
 E.  
*Echinochloa Crus-Galli* var. (?) *lacunarium* Hughes, 320.  
 Elwes, H. J., 36.  
*Entolasia marginata* Hughes, 331.  
 — *stricta* Hughes, 331.



Eriocaulon, Indian species of, 303.  
Euphorbiaceae, new, from Malay Peninsula, 360.

## F.

Falkland Islands, additions to flora of, 369.  
Farm land, Poplars for, 95.  
Fiji, Citrus industry in, 261.  
Flacourtiaceae, Upper Guinea, notes on, 265.  
Flora Australiensis, Panicum of the, 305.  
— of the Falkland Islands, additions to, 369.  
— Madras, 128.  
— Siamese, 411.  
— of Sinaloa, contributions to, 103, 163, 333, 388.  
— — West Africa, 404.  
Forest Officers' Handbook, Gold Coast, 96.  
Fruit cultivation in Trinidad and Tobago, 268.

## G.

Gamble, J. S., Neohouzeaua, a new genus of Bamboos, 89.  
Gepp, A., and Dixon, H. N., Rehmann's South African Mosses, 193.  
Germany and Austria, Botanists in, 272.  
Gilbert, Lieut. S. M., 43.  
Ginkgo biloba, fruiting of, 64.  
Glochidion glaberrimum *Ridl.*, 363.  
— pedunculatum *Ridl.*, 364.  
— stylosum *Ridl.*, 364.  
— trilobum *Ridl.*, 364.  
Gold Coast Forest Officers' Handbook, 96.  
Grove, W. B., The British Species of Ceuthospora and Cytosporina, 353.  
— The British Species of Cytospora, 1.

## H.

Habenaria medioflexa *Turrill*, 118.  
Halimium concolor *Riley*, 107.  
Harland, Dr. S. C., 402.  
Heliocarpus, notes on, 348.  
— chontalensis *Sprague*, 350.  
— costaricensis *Sprague*, 349.  
Hill, A. G. G., 303.  
Homalium subsuperum *Sprague*, 184.  
Hosackia madrensis *Sprague et Riley*, 335.

## I.

Ichnanthus australiensis *Hughes*, 329.  
— majusculus *Hughes*, 329.

Ichnanthus Muelleri *Hughes*, 329.

— oblongus *Hughes*, 328.

— pauciflorus *Hughes*, 330.

Imperial College of Tropical Agriculture, 403.

Index Kewensis, 95.

— additions to, 120.

— citations of generic names in, 239.

Inga oophylla *Riley*, 401.

Iraq, Dates and Date Cultivation, 271.

## K.

Kalanchoë connata *Sprague*, 183.

Kendall Australian Collection, presentation of, 404.

Kew :—

Gardens, additions to, 45.

Garden Operations, 1922, 44.

Herbarium, additions to, 59.

— report of, 1922, 57.

Jodrell Laboratory, research in, 52.

Kendall Australian Collection presented to Herbarium, 404.

Library, presentations to, 53.

Lloyd Herbarium presented, 189, 240.

Microscope presented, 405.

Museums, 50.

Original Drawings of Botanical Magazine presented by R.H.S., 176.

Visit of The Queen, 402.

Visitors in 1922, 43.

Kirkham, V. H., 403.

## L.

Lane, G. T., retirement of, 403.

Lepidagathis Barberi *Gamble*, 375.

Leptoloma papposa *Hughes*, 314.

Leucospermum cordatum *Phillips*, 185.

Lewin, Lieut. C. J., 43.

Lilac wood, 240.

Lloyd Herbarium, presentation of, 189, 240.

Lupinus delicatulus *Sprague et Riley*, 334.

Lyne, F. S., 94.

## M.

Macaranga quadricornis *Ridl.*, 367.

— robiginosa *Ridl.*, 367.

Madras, Flora of, 128.

Malay Peninsula, New Euphorbiaceae from, 360.

Marquand, C. V. B., 128.

Martin, Capt. R. F., 303.

Mason, T. G., 128.

Menzies' Journal of Vancouver's Voyage, 269.

- Millard, W. A., and Burr, Sydney,  
Causative Organism of Skin spot  
of Potatoes, 273.  
Miscellaneous Notes, 43, 94, 128,  
175, 185, 238, 268, 303, 351, 402.  
Mosses, Rehmann's South African,  
193.

## N.

- Neohouzeaua, a new genus of Bam-  
boos (with figs.), 89.  
— Dullooa, 91.  
— Helfer *Gamble*, 91.  
— tavoyana *Gamble*, 92.  
Neolithic deposits in Bulgaria,  
*Xanthium spinosum* in, 190.  
New York, Pears of, 188.  
Nicholas, H., 94.  
North, W. V., 403.  
Northern Trees in Southern Lands,  
303.

## O.

- Obituary Notices :—  
Balfour, Sir I. B., 30.  
Cheeseman, T. F., 411.  
Elwes, H. J., 36.  
Dummer, R. A., 94.  
Robson, W., 238.  
Ventry, Lord, 403.  
Oospora pustulans, 273.  
Orophea salacifolia *Hutchinson*, 371.  
— tortulosa *Hutchinson*, 115.  
Orthachne and Streptachne (with  
figs.), 301.  
— rariflora *Hughes*, 302.  
Oxalis lanceolata *Riley*, 166.  
— primavera *Riley*, 166.  
— Trientalis *Riley*, 166.  
— yucatanensis *Riley*, 166.

## P.

- Paintings of Burmese and Madras  
Plants, 404.  
Panicum of the Flora Australiensis,  
305.  
— cymbiforme *Hughes*, 323.  
— delicatum *Hughes*, 323.  
— fulgidum *Hughes*, 323.  
— larcomianum *Hughes*, 326.  
Paractaenium *Beauv.* emend *Hughes*,  
289.  
— novae-hollandiae (with figs.),  
287.  
Para Rubber and Coffee in Uganda,  
185.  
Paspalidium basycladum *Hughes*,  
318.  
— distans *Hughes*, 317.  
— globoideum *Hughes*, 317.  
— gracile *Hughes*, 318.  
— — var. rugosum *Hughes*,  
318.  
— inaequale *Hughes*, 317.

- Paspalidium jubiflorum *Hughes*, 317.  
— rarum *Hughes*, 318.  
— retiglume *Hughes*, 317.  
— semitonsum *Hughes*, 317.  
Pears of New York, 188.

Peradeniya, Ceylon, New Labora-  
tories, 63.

Phyllanthus campanulatus *Ridl.*,  
362.

— erythrocarpus *Ridl.*, 362.

— Hullettii *Ridl.*, 363.

Phylogenetic classification of Flow-  
ering Plants, Contributions to-  
wards a (with figs. and maps), 65,  
241.

Piriqueta (Erblichia) xylocarpa  
*Sprague et Riley*, 373.

Pita and Silk Grass, 266.

Plant Names, 191.

— — Siamese, 272.

Polygala sinaloensis *Riley*, 108.

Poplars for Farm Land, 95.

Popowia cauliflora *Chipp*, 182.

— diclina *Sprague* emend. *Chipp*,  
182.

Potatoes, Skin spot, The Causative  
Organism of (with plates and  
figs.), 273.

Primula calciphila (with plate and  
figs.), 97.

— — *Hutchinson*, 101.

## Q.

Quebracho Colorado, 191.

Queen, The, visit of, 402.

## R.

Rehmann's South African Mosses,  
193.

Rhannus dianthes *Riley*, 172.

— Gonzalezii *Riley*, 173.

Rhododendron micranthum, affinity  
of (with map), 299.

Ridley, H. N., New Euphorbiaceae  
from the Malay Peninsula, 360.

Riley, L. A. M., Contributions to the  
Flora of Sinaloa, 103, 163, 333,  
388.

Ringorea from West Africa, new  
species of, 289.

— adnata *Chipp*, 295.

— Aylmeri *Chipp*, 294.

— Batesii *Chipp*, 297.

— bracteolata *Chipp*, 298.

— brevircemosa *Chipp*, 293.

— crassifolia *Chipp*, 299.

— glaucophylla *Chipp*, 298.

— Johnstonii *Chipp*, 299.

— kibbiensis *Chipp*, 292.

— obanensis *Chipp*, 299.

— oblanceolata *Chipp*, 292.

— oblongifolia *Marquand*, 296.

- Rinorea ovata* Chipp, 297.  
 — *parviflora* Chipp, 295.  
 — *pilosa* Chipp, 294.  
 — *prasina* Chipp, 299.  
 — *punctata* Chipp, 293.  
 — *rubrotincta* Chipp, 294.  
 — *sinuata* Chipp, 297.  
 — *subauriculata* Chipp, 291.  
 — *Talbotii* Chipp, 299.  
 — *varia* Chipp, 298.  
 — *verrucosa* Chipp, 293.  
 Robson, W., 238.  
 Royal Horticultural Society, Original Drawings of Botanical Magazine presented by, 176.  
 Rubber, Para, and Coffee in Uganda, 185.  
 Rubiaceae, Bacterial Nodules of, 346.

## S.

- Sacciolepis myosuroides* Hughes, 330.  
 Sahara, *Solenostemma* Argel in the, 239.  
 Scottellia Chevalieri Chipp, 265.  
 Shepherd, E. F. L., 43.  
 Siamese Flora, The, 411.  
 — Plant Names, 272.  
 Silk Grass, Pita and, 266.  
 Sinaloa, Contributions to the Flora of, 103, 163, 333, 388.  
 Skin spot of Potatoes, Causative Organism of (with plates and figs.), 273.  
*Smithia parvifolia* Burt Davy, 183.  
*Solenostemma* Argel in the Sahara, 239.  
 South African Mosses, Rehmann's, 193.  
 — — National Herbarium, 405.  
 Southern Lands, Northern Trees in, 303.  
 Staples, Capt. E. G., 43.  
 Streptachne, Orthachne and (with figs.), 301.  
 Streptolophus, a new genus of Gramineae (with figs.), 177.  
 — *Hughes*, gen. nov., 178.  
 — *sagittifolius* Hughes, 178.  
*Strobilanthes circarensis* Gamble, 373.  
 — *Lawsoni* Gamble, 374.  
 — *urceolaris* Gamble, 374.

## T.

- Tephrosia Brandegei* Riley, 339.  
 — *foliolosa* Riley, 339.  
 — *hypoleuca* Riley, 339.  
 — *pachypoda* Riley, 340.  
 — *submontana* Riley, 341.  
*Tetracera affinis* Hutchinson, 180.  
 — *eriantha* Hutchinson, 181.  
 Tobago, Fruit Cultivation in Trinidad and, 268.  
*Torenia courtallensis* Gamble, 116.  
*Tragia laevis* Ridl., 368.  
 Trees, Northern, in Southern Lands, 303.  
*Trigonostemon salicifolius* Ridl., 366.  
 Trinidad and Tobago, Fruit Cultivation in, 268.  
*Triumfetta arborescens* Sprague, 351.  
 — *Sanctae-Luciae* Sprague, 114.

## U.

- Uganda, Para Rubber and Coffee in, 185.  
 Upper Guinea Flacourtiaceae, notes on, 265.  
*Urochloa Gilesii* Hughes, 319.  
 — *notochthona* Hughes, 319.  
 — *praetervisa* Hughes, 319.

## V.

- Vaccinium Gonzalezii* Riley, 116.  
 Vancouver's Voyage, Menzies' Journal of, 269.  
*Vanda punctata* Ridley, 118.  
 Vegetation and Soils of Africa, 410.  
 Ventry, Lord, 403.

## W.

- Walters, E. A., 43.  
 West Africa, Flora of, 404.  
 — new species of *Rinorea* from, 289.  
 West Indian Agricultural College, change of name, 403.  
 Wood, Destructive Distillation of, 270.  
 Wright, C. H., 261.

## X.

- Xanthium spinosum* in Neolithic deposits in Bulgaria, 190.  
*Xylopia villosa* Chipp, 183.